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THE POSTOPERATIVE CARE OF THE URINARY BLADDER

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AND
RICHARD W. TE LINDE, M.D.
BALTIMORE

Every one with any surgical experience will agree that difficulties in voiding play a major role in postoperative discomfort. The closer the field of operation approaches the bladder region, the greater the difficulty in voiding spontaneously and the greater the discomfort from overdistention. Hence, the postoperative care of the bladder concerns the gynecologist more than any other surgeon. In recounting their hospital experiences, patients frequently mention the discomfort from overdistention or from catheterization among their most unpleasant memories. There is, however, an even more important reason than the patient's comfort for the proper handling of the bladder after operation. Many chronic and serious urinary tract lesions have their origin in mismanagement of the bladder at this time. In our experience in female urologic conditions we have been struck with the frequency with which patients date their illnesses from trouble in emptying the bladder after operation.

In 1925 a routine was established in the gynecologic service of the Johns Hopkins Hospital which had for its purposes the promoting of postoperative voiding and minimizing the use of the catheter. The procedure consists of the instillation into the bladder of 1 ounce (30 cc.) of 0.5 per cent aqueous solution of mercurochrome at the conclusion of the operation, while the patient is still on the operating table. Here sterile technic should be at its best as well as easiest. At the same time the patient is given rectally 1 liter of 2 per cent sodium bicarbonate solution containing 60 cc. of liquid petrolatum. This rectal instillation of fluids was borrowed from the clinic of the late John G. Clark of Philadelphia. It has for its purpose the insurance of a good alkaline fluid intake during the early postoperative period and the softening of the fecal material in the lower part of the bowel, which it is hoped will facilitate early defecation. It was also thought that an adequate early fluid intake would give the bladder "something to work on" in its early attempts at emptying itself. Whether the giving of this fluid by rectum has any beneficial effect in bringing about early micturition will be discussed later in considering the results of our experience. The originator of the idea that a bladder instillation of mercurochrome might facilitate postoperative voiding is not known to us.

The favorable results of our early experiences were reported by Craig [1] in a western journal in 1930. As a result of this there has been an adoption of the procedure in some clinics on the West Coast, but generally it is little used. Our results over a long period have been so satisfactory in cases of pelvic laparotomy that we believe they should be brought to the attention of the general profession.

In 1914 Taussig [2] concluded from his study that the danger of infection from catheterization lay less in the technic than in urinary stagnation. Curtis [3] has repeatedly emphasized that simple catheterization at times other than in the postoperative period is relatively harmless. Our experience confirms the views of both of these men. In our outpatient department and in private practice we pass catheters several times a day to obtain urine for diagnostic reasons. We have never had any reason to believe that this procedure has been responsible for a urinary tract infection. Our technic in the outpatient department is simply to swab the urethral meatus with two successive toothpick swabs dipped in 5 per cent mercurochrome. Because of the undesirable staining qualities of mercurochrome, we have substituted an aqueous solution of 1:1,000 merthiolate in the office with equally satisfactory results. With this technic the bacterial flora about the meatus is reduced, but we do not claim for it complete sterilization of the meatus and certainly not of the outer urethra. Undoubtedly some bacteria are introduced into the bladder, but in spite of this we have never seen cystitis occur. The ability of the patient to empty her bladder completely at subsequent voidings apparently prevents the development of cystitis. In dealing with the bladder postoperatively, one is confronted with the additional factor of residual urine. That there is practically always residual urine postoperatively, even when the patient voids from the beginning, has been well demonstrated by Taussig.[2] He compared the total amount of urine voided in a given time in a group of thirty who voided spontaneously with the total amount obtained by catheter in a group of thirty over an equal period. An average of 5 ounces (150 cc.) more of urine was obtained by catheter from each patient. That there is residual urine for a time in those patients who have required one or more catheterizations has been demonstrated innumerable times by all who practice catheteri-

From the Gynecological Department, Johns Hopkins University.
Read before the Section on Obstetrics and Gynecology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Craig, Robert G.: Bladder Care After Abdominal Operations, California & West. Med. **32**: 162 (March) 1930.
2. Taussig, Fred J.: Bladder Function After Confinement and After Gynecological Operations, Tr. Am. Gynec. Soc. **40**: 351, 1915.
3. Curtis, Arthur H.: The Bladder of Women After Operation: A Consideration of Postoperative Bladder Disturbances, with Special Regard to Treatment, Based on a Study of This Subject in the Care of 465 Cases Operated Within the Last Eighteen Months, Am. J. Obst. **78**: 230 (Aug.) 1918; Residual Urine in Women, Surg., Gynec. & Obst. **50**: 689 (May) 1925; A Study of Bladder Function, ibid. **29**: 24 (July) 1919.

zation for residual urine after the resumption of micturition. Once one has catheterized a patient postoperatively and presumably introduced a few bacteria, it becomes important to prevent stasis of residual urine on resumption of voiding. We watch the patient carefully after catheterization; if the frequent voiding of small amounts or quickly recurring bladder discomfort after voiding of even larger amounts suggests residual urine we catheterize at least once daily until the residue is reduced to 50 cc. or less. Our experience in reducing the incidence of urinary tract infections by this routine has convinced us of its importance. However, all students of this subject admit the desirability of doing away with the catheter entirely if possible. Any procedure which makes a real advancement toward this end is worthy of consideration.

Most reports on methods of promoting voiding are concerned with inducing the bladder to empty itself after postoperative retention has occurred. The usual procedures of running water, putting warm water in the bedpan, giving enemas, irrigating the perineum and elevating the patient to a partial sitting position are known to all surgical nurses and physicians. They undoubtedly are of value, especially in those cases in which the psyche plays a large role. Drugs have been used extensively. Several years ago some rather enthusiastic reports appeared on the use of solution of posterior pituitary, but subsequent experience has proved disappointing. The parasympathetic stimulators doryl (carbaminolcholine chloride) and mecholyl (acetylbetamethylcholine chloride) have been used widely with some success. Doryl was first used clinically by Schulze,[4] who noted success in 80 per cent of a large series of patients with urinary retention after childbirth and gynecologic operations. Subsequently the drug has been used in England [5] and in this country with considerable success. Constitutional disturbances such as sweating, fainting, salivation, vomiting and a drop in blood pressure are noted in about one third of the cases. The writers on the subject do not consider these symptoms alarming. In our clinic we have had a limited experience with mecholyl administered by mouth in a dose of 25 mg. and we have had some success. We have seen no serious constitutional effects. Administered hypodermically, however, we feel that it is dangerous and the alarming constitutional effects far outweigh the beneficial effects in promoting voiding. In two instances we have been greatly alarmed by the sudden onset of profuse sweating, salivation, fainting, involuntary urination and defecation and a marked drop in blood pressure. In another institution in this city the hypodermic administration of 25 mg. of mecholyl resulted in death before the antidote of atropine could be administered.

The injection of irritants into the full bladder has been used to induce voiding. Baisch [6] advised the injection of 20 cc. of 2 per cent boroglycerin solution into the full bladder, but Taussig [2] thought that this was responsible for cystitis in certain cases. Taussig [2] noted on doing air cystoscopy the not infrequent tendency of the bladder to contract as the air rushed in. He therefore tried the injection of several ounces of air into the full bladder as a mild vesical irritant and reported success in nine of eleven cases.

4. Schulze, Eberhard: Zur Behandlung der Harnverhaltung im Wochenbett und nach gynäkologischen Operationen, München. med. Wchnschr. **82**: 1358 (Aug.) 1935.

5. Maxwell, J. S.: The Treatment of Postoperative Retention of Urine with Doryl, Lancet **1**: 263 (Jan. 30) 1937. Moir, Chassar: The Use of Doryl in Postoperative and Postpartum Retention of Urine, ibid. **1**: 261 (Jan. 30) 1937.

6. Baisch, cited by Taussig.[2]

The method under discussion in this paper approaches the problem from a different angle. Our procedure is an attempt not to empty the distended bladder but rather to prevent distention by inducing the patient to void early.

In our series there were 500 pelvic laparotomy patients who were given the mercurochrome bladder instillation and the fluid by rectum in the operating room. Six and six-tenths per cent of these patients required one or more catheterizations. In a control series of 257 patients with pelvic laparotomies, done at another hospital, 51 per cent required catheterization. In this institution the routine postoperative order was for eight hour catheterization if necessary, whereas in our group the order was for catheterization twelve hours after the operation, if necessary, and after this every eight hours. This difference in orders, however, affected the time of first catheterization very little, for in the control group the average time after operation at which the first catheterization was done was ten hours and twenty-four minutes, whereas in our group it was ten hours and fifty-three minutes. The percentage of catheterizations in the control group is considerably higher than in many series reported in the literature, but both of our groups represent, for the most part, extensive pelvic laparotomies. The conclusion seems to be justified that catheterization has been reduced in our series to almost one eighth by this simple procedure.

We attempted to determine what effect the administration of fluid by rectum had on postoperative voiding. We were able to collect records on only fifty-four cases of laparotomy in which the bladder instillation was given but the fluid by rectum omitted. Five and six-tenths per cent of the patients required catheterization. Although this series is small we believe that it indicates that the essential part of our procedure is the bladder instillation; although we feel that the fluid by rectum is desirable for other reasons, we do not believe that it facilitates voiding.

The time and amount of first voiding in our laparotomies are interesting and instructive. For 551 laparotomy patients who received our routine treatment, the average time of the first voiding was five hours and thirty minutes. For the control series of 132 patients, who did not receive this postoperative treatment, the average time of first voiding was nine hours and twenty-six minutes. For a series of 495 patients receiving routine treatment, the average amount of the first voiding was 194 cc. whereas for a control series of 125 patients, who voided without catheterization and without treatment, the average amount was 168 cc. These data seem to show that by means of this routine the patients more completely emptied their bladders, for in five and one-half hours more urine was obtained than was voided in almost double the time by a control series. Considering the importance of complete emptying of the bladder in relation to the prevention of urinary infection, we believe that this accomplishment is a strong point in favor of our procedure.

The mode of action of the mercurochrome in promoting voiding has interested us; we believe it is due to a temporary chemical irritation of the bladder. Occasionally a little microscopic blood can be noted in the first specimen, but in only one case in our series was there gross hematuria. Often the patient calls for the bedpan as she is arousing from the anesthetic and complains of a marked desire to void before sufficient time has elapsed after operation to allow an appreciable amount of urine to collect in the bladder. The bladder

irritation usually disappears in twenty-four hours. Although the average first voiding is 194 cc., the amounts of subsequent voidings rapidly increase and we believe it is a reasonable assumption that complete emptying of the bladder is soon obtained.

The influence of the duration of the anesthetic confirms an impression which, we are sure, has been noted by most surgeons. We arbitrarily divided our laparotomy patients into two groups. In the first group, containing 227, the duration of anesthesia was less than one and one-half hours; 4.4 per cent of these required catheterization. In the second group, of 272, the duration of anesthesia was more than one and one-half hours and 7.4 per cent required catheterization. We were also interested in noting the effect on voiding of avertin with amylene hydrate as a basal anesthetic. In 280 cases in which this was used, supplemented by ether, 8.2 per cent of the patients required catheterization. In 217 cases gas, oxygen and ether were used and only 3.7 per cent required catheterization. It seems reasonable to suppose that the latter group recover more quickly from the anesthetic and hence are more acutely sensitive to the impulse to void. On the other hand, the avertin group are lethargic for most of the day of operation and hence less aware of their full bladders, which therefore require catheterization in a larger percentage of cases.

Although the postoperative comfort of the patient is of great importance to her, the avoidance of a persistent urinary tract infection is even more essential in the long run. We therefore made a study of our cases from that point of view. We sought to determine how many of our patients had evidence of cystitis on discharge from the hospital. In only one of the 500 cases was a bladder symptom present on discharge, and this consisted of only slight frequency but no burning. It was noted in the patient's history that she had had an attack of frequency and burning several years prior to admission, but her urine on admission was normal microscopically. Despite the symptoms just noted, the urine culture was negative on discharge.

Among the 500 patients who received our treatment, two developed pyelitis postoperatively, but in both cases there was a history of previous urinary tract infection. A short summary of these two cases follows:

CASE 1.—The patient complained of nocturia, having voided three to four times per night for two years, and of dysuria for three months before admission. The urine, however, was clear microscopically on admission, but no culture was made. On the third postoperative day the patient had a temperature of 103.2 F. and on the fourth day Bacillus coli was cultured from the bladder urine, which contained many white blood cells. On the fifteenth postoperative day the urine culture again showed B. coli but the patient had no symptoms. She was discharged on the twentieth postoperative day, still with a low grade fever. Twenty days later she returned to the hospital with typical acute pyelitis. She was treated with sulfanilamide and the urine became sterile. On discharge, after ten days of therapy, the patient was symptom free.

CASE 2.—On admission the patient gave a history of nocturia, voiding twice a night, and catheterized urine showed occasional clumps of white blood cells. The postoperative course was not remarkable and she had been allowed to walk. On the twentieth day she had a chill and a temperature of 104 F. The urine was loaded with white cells, and B. coli was cultured. The temperature became normal on the twenty-eighth day but the culture was still positive. Subsequent follow-up study in the dispensary revealed no residual urinary disturbance.

Here, then, are two cases of postoperative pyelitis and one of mild bladder symptoms in our series of 500 cases, but all three patients had histories of previous urinary tract infection. Let us compare these results with those of our control series of 249 laparotomy patients from another hospital. The postoperative history notes were less complete than in our series, so details such as notes on cultures and catheterized specimens were often lacking. However, in this group there were five cases of clinical cystitis and two of pyelitis. In none of these was there any evidence of preexisting urinary tract infection, but as before mentioned the histories were not as complete as those in our own series. Comparing these results with those of our own, we believe that we are justified in concluding that urinary tract infections are less frequent in patients treated according to our routine. In fact there was no postoperative infection in any patient who did not have a previous history of infection.

Our results with this procedure after the vaginal plastic operations were less successful. In fact our study shows that the procedure is of no value in promoting voiding after extensive vaginal operations. In our series of fifty-nine vaginal plastic cases, which includes twenty-five interposition operations, 58 per cent of the patients required catheterization. In our control series, in which patients did not receive our treatment, there were sixty-two cases, including twenty-eight interposition operations. Exactly the same percentage (58) of the patients required catheterization. Our clinical impression has been that the Watkins interposition operation offers the greatest difficulty with postoperative voiding. Our statistics bear out this impression, for after a total of fifty-three interposition operations in both series 72 per cent of the patients required catheterization.

Since there is nothing in our statistics to indicate that our procedure is of any value in promoting voiding after extensive vaginal plastic operations, we have returned to the use of an indwelling male catheter for the first week. Certainly with the interposition operation this is the logical procedure, as only 28 per cent of the patients voided spontaneously. There is little doubt that infection travels into the bladder via the indwelling catheter, but this is apparently of little significance since few of these patients have bladder symptoms following removal of the catheter. When it is removed at the end of a week the bladder has generally so regained its tone that spontaneous and complete micturition follows. If there is any indication of residual urine the patient should be catheterized until it has been proved that such a residue no longer exists.

The importance of avoiding overdistention of the bladder was well illustrated in one of our interposition cases. The patient began to void spontaneously postoperatively but voided frequently and in small amounts without relief. She was finally catheterized on the third day, and 700 cc. of urine was obtained. In the next twenty-four hours she was catheterized for great distress three times, and 800 cc., 700 cc. and 450 cc. of urine were obtained successively. On the fourth postoperative day her temperature rose to 103 F. and she had costovertebral tenderness on the right. On the fifth day an indwelling catheter was inserted, and the temperature became normal in twenty-four hours. This case also indicates that a routine order for catheterization every eight hours if the patient voids less than 100 cc. at one time is not entirely satisfactory. This patient voided as much as 200 cc. at a time but apparently only as an overflow. She should have been catheterized for bladder distress long before her bladder

became so distended, but the nurse, adhering literally to the 100 cc. rule, failed to pay proper attention to the patient's distress. With such severe bladder discomfort the nurse should have called the intern, who undoubtedly would have ordered catheterization earlier.

SUMMARY

A special technic to promote postoperative voiding consists of instilling into the bladder 1 ounce of 0.5 per cent aqueous solution of mercurochrome in the operating room. The results after pelvic laparotomies have been very gratifying, the incidence of catheterization having been reduced from 51 per cent in a control series to 6.5 per cent in a series of 500 cases in which this procedure was used. An instillation of a liter of fluid by rectum at the same time was found to be of no value in reducing the incidence of catheterization. Evidence has been presented to show that the patients in whom the instillation was used voided earlier and in greater amounts, thus more completely emptying the bladder than the patients in the control series. It has been shown that the shorter the anesthesia the greater the likelihood of spontaneous postoperative micturition. The patients receiving a basal anesthesia of avertin with amylene hydrate required catheterization in 8.2 per cent while those given straight gas, oxygen and ether required catheterization in only 3.7 per cent. Postoperative urinary tract infection, as judged by symptoms of cystitis on discharge and pyelitis, did not occur after any of the 500 laparotomies in which the procedure was carried out, with the exception of three cases. In each of these there was a definite history of urinary tract infection preoperatively. The procedure has been shown to be of no value in case of extensive plastic operation, in which an indwelling male catheter is considered the most satisfactory procedure.

ABSTRACT OF DISCUSSION

DR. GEORGE H. GARDNER, Chicago: An ideal method of managing the bladder after gynecologic operations should be equally effective after all types of operations, cause the patient a minimum of discomfort, safeguard the integrity of sutures that have been placed near the bladder, and finally not only eliminate acute complications of the upper urinary tract from postoperative problems but also obviate chronic conditions in the lower urinary tract as permanent sequelae of gynecologic surgery. The technic which Dr. Arthur H. Curtis described and which has been the routine in our service at Passavant Memorial Hospital for ten years is a close approach to the ideal. Our patients are subjected to intermittent catheterization; they do not have indwelling catheters. They are catheterized for distress, not after any specified number of hours, but for any marked discomfort which may be ascribable to a distended bladder. We endeavor to avoid overdistention and consider the accumulation of more than 350 cc. of urine as being potentially harmful. After a woman has been catheterized two or more times or has worn an indwelling catheter, her bladder is infected. Such an infection rarely attains significant proportions, if the physician and his staff are residual urine conscious. Consequently, after our patients start to void they are catheterized once or twice daily for residual urine until that residual is persistently less than 15 cc. in amount and is grossly clear. I prefer intermittent catheterization with routine check for residual urine, because this method is equally applicable to all patients and we realize that simplicity in hospital routine makes for more efficient care of patients. We do not favor retention catheters, either male or de Pezzer, because they give one a false sense of security; indwelling catheters do not always drain the bladder completely, as they tend to become displaced and plugged. After a retention catheter has been removed it is vital that the patient be checked in a routine way for residual urine.

DR. WILLIAM T. KENNEDY, New York: Nature has to overcome obstacles to restore the bladder to normal following pelvic or vaginal operations. First, some patients come for operation having been below par physically; they have very mild, low grade infections of the upper urinary tract, with some desquamation. This at operation suddenly becomes more active and for the first few postoperative days the sediment in the bladder is increased; this with the associated loss of muscle tone of the bladder permits the accumulation of a precipitate which on standing breaks down into the alkaline ammonia salts to irritate the base of the bladder. Only part of this precipitate passes out when the patient voids. Nature has two resources: one, to increase the flush from the kidneys; the other, to send bacteria in to clean up this mixture of mucus, desquamated cells, and so on. The colon bacilli are those elected. How they get in I do not know, but I doubt that it is through the urethra. Here is our opportunity to help nature. The first catheterization for residual urine is done and it is allowed to stand for a couple of hours for sedimentation. If sediment is present, the bladder is irrigated with boric acid solution and an ounce of 10 per cent solution of caroid or papain instilled into the bladder. This will materially aid in clearing up the base of the bladder. This is repeated daily for three or four times. Instillation of antiseptics at this time would only inhibit nature's bacterial processes. With the recent advent of neoprontosil, I feel that much could be accomplished in preventing this complication by giving the drug three or four days before operation. Second, the next obstacle to overcome is the diminished function of the kidneys. This is best activated by clysis or intravenous saline solution or dextrose, as well as all the fluids which can be tolerated by mouth. Drs. Woodruff and Te Linde found that the rectal instillation had little effect on the bladder. Most fluids are used by the body in counteracting dehydration. The return of the urine flow to normal may roughly be estimated by the excretion of 400, 800, 1,200 and 1,600 cc. on the first four successive days. Third, the next obstacle nature has to overcome is the loss of bladder muscle tone either when the bladder structures have been unmolested or considerably disturbed by operative procedures. Comparing the treated cases with the untreated controls for the time of first voiding and the amount voided, one is amazed that the treated bladder voids more urine than the untreated one and almost twice as soon. The kidneys were either more active or there was less residual urine, and I am forced to believe there was less residual urine. The authors have made definite progress in eliminating this worst offender (residual urine). In the care of the bladder after operation I use an indwelling male catheter for about a week, watch the urine carefully for sediment and, if it appears, irrigate the bladder and instil caroid or papain solution into it. After the catheter has been removed I catheterize the patient twice a day immediately after voiding until the residual urine is one-half ounce or less.

Greater Mortality Among Males.—About one quarter of the known pregnancies result in stillbirths. Great numbers of these aborted babies have been examined, and some surprising data obtained. In embryos aborted when they are about three months old, specialists can already distinguish sex, and in these early mortalities they have found that the males outnumber the females almost four to one. These, however, are but a small percentage of the total stillbirths. In those in the fourth month, aborted males are double those of females, in the fifth month 145 males to 100 females, in the next few months the proportion drops further, but just before birth there is a rise to almost 140 males aborted to every 100 females. All this leads to another conclusion: That before birth, certainly, males as a class are not only not stronger than females but, quite on the contrary, are weaker. If we look beyond birth we find, moreover, that at almost every stage of life, males drop out at a higher rate than females. It may very well be, then, that a canny Nature enters more males than females at the start of life's race in order to counterbalance the difference in mortality.—Scheinfeld, Amram: You and Heredity, New York, Frederick A. Stokes Company, 1939.

PRIMARY PERITONITIS IN INFANTS AND CHILDREN

A MORE EFFECTIVE TREATMENT

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Primary, idiopathic or metastatic peritonitis has always been associated with a very high mortality rate in infants and children. In recent years, with the use of sulfanilamide and antipneumococcus serum, we have markedly lowered the mortality rate in this disease and have revised our therapeutic approach. It is our purpose in this paper to present an effective treatment of the disease and the information gained from sixty-seven cases of primary peritonitis observed in the ten year period 1929-1939 at the Children's Hospital.

ETIOLOGY

The offending organism in primary peritonitis is usually the pneumococcus or the hemolytic streptococcus. Three patients with primary peritonitis, not included in this series, were encountered in whom no organisms were demonstrable by direct smear or culture of the peritoneal exudate. The streptococcus was found more than twice as frequently as the pneumococcus, since there were forty-seven cases attributable to the former and twenty cases to the latter.

The pathways by which the organism may enter the peritoneal cavity have received detailed consideration in previous reports.[1] The possible modes of entry are by way of (1) the blood stream, (2) the vagina and fallopian tubes in females, (3) the gastrointestinal tract and (4) the transdiaphragmatic lymphatics.

In the present series blood cultures were made on twelve patients with pneumococcic peritonitis, and ten of these were positive. Similar cultures were made on eighteen patients with streptococcic peritonitis, and four were positive. Cultures of material from the vagina were taken of three patients with pneumococcic peritonitis, and one yielded the same type of pneumococcus as that isolated from the peritoneal cavity. Vaginal cultures were taken of six patients in the streptococcus group, and three were positive for hemolytic streptococci. Cultures of material taken from the throat of five patients with pneumococcic peritonitis failed to reveal the offending organism, although in each other types of pneumococci were isolated. In the streptococcus group, four throat cultures were made and two of these were positive for hemolytic streptococci.

Of the forty-one patients who died, twenty came to autopsy, including eight females. In no instance was there evidence of an ascending infection along the genital tract.[2] In the absence of more convincing evidence concerning the other possible routes, we feel that the probable mode of entry is by way of the blood stream.

From the Departments of Surgery and Pediatrics of the Children's Hospital and the Harvard Medical School.

1. McCartney, J. B., and Fraser, J.: Pneumococcus Peritonitis, Brit. J. Surg. **9**: 479-489 (April) 1932. Obadelek, W.: Die Frühoperation der Pneumokokkenperitonitis im Kindesalter, Zentralbl. f. Chir. **58**: 1250-1258 (May 16) 1931. Rischbiath, H.: On Pneumococcus Peritonitis, Quart. J. Med. **4**: 205-231, 1910. Glazier, M. M.; Goldberg, B. I., and Weinstein, A. A.: Primary Pneumococcic Peritonitis: Recovery of the Acute Serous Type Following Type I Serum Treatment Without Surgical Intervention, Ann. Int. Med. **10**: 1042-1049 (Jan.) 1937.

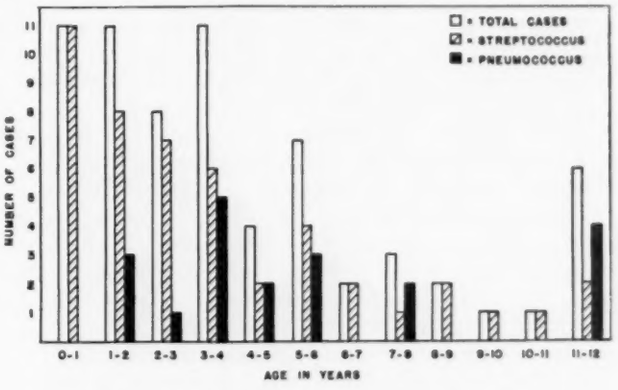
2. Farber, Sidney: Personal communication to the authors.

The types of pneumococci isolated in peritonitis have not been noted in the majority of publications on the subject, but those reported show a preponderance of the type I pneumococcus.[3] In the present series of cases there were five of type I, four of type VI, two of type V and one each of types IV, VIII, X, XI, XVIII and XXII. No conclusions can be drawn from the available material as to the relation of the type of pneumococcus to the severity of the peritonitis.

AGE AND SEX

The disease is much more common in the first four years of life, as shown in the accompanying chart. Streptococcic peritonitis has its highest incidence during infancy, whereas pneumococcic peritonitis predominates between the ages of 2 and 7 years. The latter observation is in accord with the observations of McCartney and Fraser.[1]

There were no appreciable differences in the sexes in the total group or when they were divided into their etiologic groups (table 1). However, it is to be noted that six of the male patients in the pneumococcic group had nephrosis whereas only two females of the same group had nephrosis. Excluding the patients with



Incidence of primary peritonitis according to age.

nephrosis, there would be a definite preponderance of females in the pneumococcic group, an observation that has been emphasized repeatedly.[4]

CLINICAL FEATURES AND DIAGNOSIS

Primary peritonitis was preceded by an infection of the upper respiratory tract, mild or severe, in more than one half of the cases. In several cases there had been a previous otitis media or a cervical adenitis. The onset was acute and was associated with fever, abdominal pain, nausea and vomiting. The abdominal pain may be difficult to localize in infants and children, but in a large number of instances it appeared to be periumbilical. Diarrhea was a common symptom and at times was profuse. The diarrhea, if present, usually appeared in the first thirty-six hours of the disease. Some of the common symptoms and their incidence are listed in table 2.

On physical examination, patients with primary peritonitis appear severely ill and are frequently prostrated. Signs of infection of the upper respiratory tract may be present. The temperature is elevated between 103 and 105 F. and the pulse is correspondingly rapid. The abdomen is diffusely tender throughout and the general-

3. Leonardo, R. A.: Primary Pneumococcus Peritonitis, Ann. Surg. **83**: 411-416 (March) 1926. Donovan, E. J.: Surgical Aspects of Primary Pneumococcus Peritonitis, Am. J. Dis. Child. **48**: 1170-1171 (Nov.) 1934.

ized involuntary spasm may be boardlike. In infants up to 2 years of age, however, the abdomen may be "doughy" rather than spastic to palpation. Abdominal distention of varying degree may be present. Rectal examination reveals diffuse tenderness, although occasionally a pelvic abscess is detected. The remainder of the physical examination is remarkable in that it reveals nothing severe enough to account for the "toxic" picture. The leukocyte count varies between 20,000 and 50,000, with more than 80 per cent polymorphonuclear leukocytes. Urinalysis usually reveals the presence of acetone.

It is impossible to differentiate between streptococcic and pneumococcic peritonitis clinically, but we feel that primary peritonitis can usually be distinguished from

TABLE 1.—*Incidence of Primary Peritonitis According to Sex*

Primary Peritonitis	Males	Females
All cases	33	34
Pneumococcic	9	11
Streptococcic	24	23

secondary peritonitis. In the present series the correct diagnosis of primary peritonitis was made in 64 per cent of the cases on entry. We do not agree with the statement of Leopold and Kaufman [4] that "a definite clinical diagnosis of peritonitis cannot be made without operation or abdominal tap."

The condition most likely to be confused in diagnosis is acute perforated appendicitis with generalized peritonitis. However, in primary peritonitis there often has been a preceding infection of the upper respiratory tract. The age is important, as appendicitis is infrequent in the first two years of life. The patient is sicker from the onset, which may be initiated by a chill, and diarrhea is more likely to be associated with primary peritonitis than with appendicitis. Furthermore, the abdominal signs are more generalized and the fever is higher. The leukocyte count is usually higher than in peritonitis of appendical origin. It is obvious that in some instances the diagnosis between primary and secondary peritonitis will not be clear until the character of the peritoneal exudate is studied.

TREATMENT

As soon as the clinical diagnosis of primary peritonitis is made, the organism responsible must be recovered in the quickest possible manner in order that specific therapy can be instituted. Our method of choice for recovering the organism is operative. The patient is given parenteral fluids if indicated and then taken to the operating room, where under local or cyclopropane anesthesia a 1 inch muscle-splitting incision is made in the right lower quadrant. The peritoneum is merely nicked, and sufficient exudate for smear and culture is obtained by swab or gentle aspiration through a rubber catheter. A Penrose drain is inserted and the wound is closed to the drain with two or three sutures. It is important to point out that no exploration is performed and that the purpose of the procedure is to recover peritoneal exudate and incidentally to insert a drain. The advantages of this method for recovering the organism are that: 1. It is a minor operation and can be performed under local anesthesia in infants and very sick patients. 2. The results are never equivocal. 3. Drainage is established, which we feel is of considerable value, although we realize that it is impossible to drain the entire peritoneal cavity. 4. The procedure is not shocking and does not upset the patient. 5. If the peritonitis is due to appendicitis, the incision is easily enlarged for an appendectomy. Abdominal paracentesis has been advocated [5] as the procedure of choice for recovering organisms from the peritoneal cavity. We do not recommend it because, (1) if the results are negative, primary peritonitis has not been ruled out; (2) if the peritonitis is of appendical origin, appendectomy cannot be performed, and (3) the needle may enter a loop of bowel, which may do no harm but is undesirable.

The gross appearance of the peritoneal exudate is important. In pneumococcic peritonitis the exudate is odorless, fibrinous and soapy, while in streptococcic peritonitis it is odorless and thin and contains small flecks of fibrin. As soon as the exudate is obtained it is stained by Gram's method and cultured on blood plates, beef broth and human ascitic fluid. If the pneumococcus is present it will usually grow out in the human ascitic fluid within three hours and then can be typed. The stained smear gives an immediate clue as to the identity of the organism. It is apparent from the foregoing that the specific therapy can be instituted within several hours after the patient enters the hospital. The administration of the specific therapy will be discussed later.

The after-care of the patient is very important. The patient is placed in a high Fowler's position and given morphine sulfate subcutaneously every four hours by the clock for the first thirty-six to forty-eight hours. Hot flaxseed poultices are applied to the abdomen every three hours. The water balance is maintained by intravenous injections of 10 per cent dextrose solution and hypodermoclyses of physiologic solution of sodium chloride. Blood transfusions are liberally employed for anemia or hypoproteinemia. If the patient does not vomit and there is no distention, water and dilute fruit juices are given by mouth several hours after operation. Fluid by mouth is increased gradually and a semisolid diet is reached by the third or fourth postoperative day. If there is vomiting or distention, constant gastric siphonage is employed. We have found the high concentration of oxygen as advocated by Fine and his associates [6] to be a valuable addition to the treatment of distention in patients with primary peritonitis. The wound is dressed frequently enough to keep it dry. The sutures are removed from the wound on the seventh postoperative day, and the abdominal

TABLE 2.—*Common Symptoms: Incidence*

	Cases
Fever	66
Abdominal pain	66
Nausea and vomiting	51
Preceding respiratory infection	42
Diarrhea	35
Constipation	23
Vaginal discharge (34 females)	4

4. Leopold, J. S., and Kaufman, R. E.: Acute Primary Streptococcus Peritonitis, J. Ped. **10**: 45-65 (Jan.) 1937. McCartney and Fraser,[3] Glazier, Goldberg and Weinstein.[1]

5. Neuhoff, H., and Cohen, J.: Abdominal Puncture in the Diagnosis of Acute Intraperitoneal Disease, Ann. Surg. **83**: 454-462 (April) 1926. Cole, W. E.: Pneumococcus Peritonitis, Surgery **1**: 386-394 (March) 1937. Leopold and Kaufman.[4]

6. Fine, J.; Hermanson, L., and Frehling, S.: Further Clinical Experiences with 95 per Cent Oxygen for Absorption of Air from Body Tissues, Ann. Surg. **107**: 1-13 (Jan.) 1938.

drain is removed between the seventh and tenth postoperative days. It is of interest that only two patients in this series required an enterostomy for intestinal obstruction following primary peritonitis.

SPECIFIC THERAPY IN STREPTOCOCCIC PERITONITIS

The dosage and method of administering sulfanilamide in use at the Children's Hospital have been reported previously by Carey.[7] In primary peritonitis, treatment with sulfanilamide may be instituted as soon as the patient has returned to the ward from the operating room, even before the results of the peritoneal culture are known. If a pneumococcus is isolated, sulfapyridine may be substituted and continued in conjunction with specific serum therapy. The initial dose of sulfanilamide may be given by hypodermoclysis of an 0.8 per cent solution in physiologic solution of sodium chloride and maintained by oral administration of crushed tablets as soon as the patient is able to tolerate fluids by mouth. During the first two or three days of treatment, doses of from 0.1 to 0.15 Gm. per pound of body weight in twenty-four hours will usually be sufficient to establish an optimal blood level of from 10 to 20 mg. per hundred cubic centimeters as estimated according to the method of Marshall.[8] The dose may be reduced by one half when definite clinical improvement is in evidence and discontinued about one week later, according to the indications in the individual case. In several of the cases reported here, administration was discontinued earlier than would seem advisable.

Seven patients with primary peritonitis due to the hemolytic streptococcus received sulfanilamide (table 3). In six of the cases the diagnosis of primary peritonitis was made at entry. One patient (case 6) was thought to have symptoms of acute appendicitis and an exploration was performed immediately. Operation revealed the true nature of the disease and pathologic examination of the appendix showed only periappendicitis. In all cases the bacteriologic diagnosis was established by cultures of the peritoneal cavity obtained at operation. Early operation was performed in all but two of the cases (cases 2 and 3). In case 3 the operation was deferred four days, and not until then was specific treatment started. Recovery followed a prolonged and stormy course. In case 2, in which the illness terminated fatally, incision of the abdomen was deferred for about eighteen hours. None of the patients with streptococcic infection who recovered had positive blood cultures, although all of them were critically ill.

The first two patients (1 and 2) who were treated with sulfanilamide received very small amounts of the drug and died. The other five patients received doses of from 0.06 to 0.1 Gm. per pound for periods which varied from one to twelve days. In most of the cases the blood levels were not recorded, and the drug was administered and discontinued arbitrarily according to the clinical appearance. Satisfactory concentrations of sulfanilamide were obtained in the blood of two patients who responded to treatment by a prompt drop in temperature and early clinical improvement. Patient 6, who made an uneventful recovery, received a dose of 0.06 Gm. per pound for only twenty-four hours, at which time the drug was discontinued because of marked nausea. While under treatment, all the patients appeared cyanotic and in all moderate anemia developed which was treated by blood transfusions.

TABLE 3.—*Patients with Primary Streptococcic Peritonitis Treated with Sulfanilamide*

Patient	Month and Year	Age		Sex	Day of Disease On Entry	Organism First Recovered			Operation		Sulfanilamide			Blood Level, Mg. per 100 Cc.	Complications	Results
		Yr.	Mo.			Source	Day of Disease	Bacteremia	Nature	Day of Disease	Dose	Day of Disease: First	Day of Disease: Last			
1	Nov. 1936	1	4	♀	6	Abdomen	6	Yes	Incision and drainage	6	Prontosil 35 cc. of total dose	6	7	None taken	.....	Died
2	March 1937	9		♀	3	Abdomen	4	Yes	Incision and drainage	4	0.025 Gm. per pound	4	11	None taken	.....	Died
3	June 1937	3	9	♂	5	Abdomen	9	No	Incision and drainage	9	0.06 Gm. per pound	9	13	None taken	Fecal fistula; bronchopneumonia	Recovered
4	Nov. 1937	5	8	♂	3	Abdomen	3	No	Incision and drainage	3	0.1 Gm. per pound 0.06 Gm. per pound	3 4	4 12	None taken	None	Recovered
5	Dec. 1938		9	♂	2	Abdomen	2	No	Incision and drainage	2	0.1 Gm. per pound	2	5	22.0 6.2	None	Recovered
6	Dec. 1938	6	5	♀	1	Abdomen	2	No	Incision and drainage, appendectomy	1	0.06 Gm. per pound	1	2	None taken	None	Recovered
7	Feb. 1939	1	7	♀	2	Abdomen	2	No	Incision and drainage	2	0.06 Gm. per pound 0.03 Gm. per pound	2 10	10 12	14.8 8.3 6.0	14th postoperative day intestinal obstruction, enterostomy	Recovered

SPECIFIC THERAPY IN PNEUMOCOCCIC PERITONITIS

Before treatment with specific antipneumococcus serum, precautions are taken in each case to determine the presence or absence of sensitivity. This includes a careful inquiry into the past history for previous injections of serum or manifestations of allergy and the usual intradermal and ophthalmic tests with a 1:10 dilution

7. Carey, B. W., Jr.: The Use of Para-Aminobenzenesulfonamide and Its Derivations in the Treatment of Infections Due to the Beta Streptococcus Haemolyticus, the Meningococcus, and the Gonococcus, J. Pediat. **2**: 202-214 (Aug.) 1937.

8. Marshall, E. K., Jr.; Emerson, Kendall, Jr., and Cutting, W. C.: Para-Aminobenzenesulfonamide, J. A. M. A. **108**: 953-957 (March 20) 1937.

of the animal serum to be used. During the testing and administration of serum, epinephrine solution should always be available for immediate use. Serum treatment is deferred postoperatively until the patient's circulation and general condition are sufficiently restored to minimize the danger of precipitatory collapse.

Serum was given exclusively by the intravenous route. The schedule of administration, gradually formulated, consisted of an initial injection of 1 cc. followed at frequent intervals of at least two hours by larger injections of from 3 to 10 cc. To minimize reactions, slowness of injection was deemed of great importance. This was facilitated by diluting each dose of serum in from 5 to 10 volumes of physiologic solution of sodium chloride. Small quantities were delivered from a standard syringe; large amounts were given as an infusion or injected through the rubber tubing of a constant

showed no growth. The blood stream of one bacteremic patient (5) was temporarily sterilized by the administration of specific antibody but reinvasion occurred and, despite continued treatment, persisted until death. Another patient (8) whose blood culture before operation was positive had a remission of symptoms and negative blood cultures postoperatively, even before specific antipneumococcic treatment was started.

Surgical incision and drainage of the abdomen was performed in seven of the eight cases. In six cases this was carried out at the earliest possible opportunity; that is, on the day of onset or admission to the hospital. Early conservatism in the policy of treating one patient (3) resulted in a considerable, although fortunately not a fatal, delay in operating and establishing the bacteriologic diagnosis. Administration of serum was started in this case prior to surgical drainage on the evidence

TABLE 4.—*Patients with Primary Pneumococcic Peritonitis Treated with Serum*

Patient	Month and Year	Age		Sex	Day of Disease at Time of Entry	Type	Organism First Recovered			Operation		Serum Treatment*			Presence of Nephrosis	Complications	Results
		Yr.	Mo.				Source	Day of Disease	Bacteremia	Nature	Day of Disease	Total Units	Day of Disease: First	Day of Disease: Last			
1	Nov. 1934	11	6	♀	1	I	Abdomen	2	+	Exploratory laparotomy, appendectomy	1	Horse 170,000	2	4	—	Pneumonia, empyema, serum sickness	Recovered
2	June 1936	7	6	♀	2	I	Blood	5	+	Incision and drainage of abdomen	6	Horse 180,000	5	6	—	Pneumonia, empyema	Recovered
3	May 1937	7	3	♀	1	I	Abdomen	1	—	Incision and drainage of abdomen	1	Horse 180,000	2	4	—	Pneumonia, abscess of abdominal wall, fecal fistula	Recovered
4	Nov. 1937	5	10	♀	4	I	Abdomen	4	—	Incision and drainage of abdomen	4	Horse 150,000	5	6	—	Pneumonia, pelvic abscess	Recovered
5	Aug. 1938	11	9	♂	Onset in hospital	IV	Blood	2	+	None (paracentesis of abdomen)	2	Rabbit 380,000	2	6	+	Intestinal obstruction, renal failure	Died
6	Sept. 1938	3	11	♂	1	VI	Abdomen	1	+	Incision and drainage of abdomen	1	Rabbit 800,000	1	4	+	0	Recovered
7	Nov. 1938		17	♀	5	V	Abdomen	1	+	Incision and drainage of abdomen; appendectomy	5	Rabbit 900,000	5	7	—	Serum sickness	Recovered
8	Feb. 1939	2	7	♀	Onset in hospital	IV	Abdomen	2	+	Incision and drainage of abdomen	1	Rabbit 66,000	2	2	+	0	Recovered

* The rabbit serum used in the last four patients from Lederle's Laboratories.

intravenous drip. When the anticubital veins were inaccessible, 24 gage needles were used and the serum was injected into small veins of the extremities or scalp.

Eight patients with proved pneumococcic peritonitis were treated more or less according to the method advocated (table 4). In every case a clinical diagnosis of primary peritonitis was promptly made from the history and physical examinations, and the bacteriologic diagnosis was established on the basis of cultures obtained from the peritoneal cavity. In six of the eight cases early operation on the day of entry to the hospital facilitated identification of the responsible pneumococcus within a few hours. In two cases (3 and 5) the invading organism was not sought immediately in the peritoneal cavity and was first detected in the blood cultures.

Bacteremia was present prior to specific serum therapy in six of the eight cases. In each instance the organism obtained from the blood stream was identical with that from the peritoneal cavity. In five of the cases all blood cultures taken subsequent to serum treatment

of a positive blood culture. At operation the appendix was removed from two patients (1 and 3) because injection and fibrin deposits on the serosal surface suggested the possibility of primary appendical involvement and the patient's condition warranted this manipulation. Subsequent pathologic examination, however, revealed only periappendicitis. Abdominal paracentesis was substituted for surgical drainage in case 5, nephrosis, in which the illness terminated fatally.

The amount of antibody required appeared to vary with individual cases, and the number reported here are too few to warrant definite conclusions. As the nature of the infection is severe, highly fatal and usually accompanied by bacteremia, serum was administered in large doses during the first twenty-four to forty-eight hours and continued until the blood stream was sterile and definite clinical improvement was in evidence. Immunologic studies were carried out in some of the more recent cases, but the data available do not at present offer a more accurate basis of estimating the antibody requirement. Reactions to serum occurred in

three cases but in no instance proved alarming. Serum sickness appeared during convalescence in two cases.

Because the bacteriostatic action of sulfanilamide against the pneumococcus has been demonstrated in vitro and applied successfully in the treatment of pneumococcic meningitis,[9] this drug was included in the therapy of three patients (5, 6 and 7), but in only one (case 6) was a satisfactory concentration of this drug in the blood achieved and maintained. Recent reports [10] on the efficacy of sulfapyridine in the treatment of pneumococcic peritonitis encouraged the administration of this drug in case 8. Clinical improvement, however, seemed to occur and the patient became nonbacteremic before the administration of sulfapyridine or serum, so that no definite conclusions can be derived in this case as to the benefit of either.

Complications attributable to the offending pneumococcus occurred in five cases, in three of which bacteremia was proved. In the four cases of type I infection pneumonia developed as a secondary disorder and was followed in two cases by empyema requiring surgical drainage (cases 1 and 3). In one case an abscess of the abdominal wall developed together with a fecal fistula, which healed slowly without surgical intervention. In case 4 a pelvic abscess developed and resolved gradually. In the case of type IV infection, the complications were incident to a fatal termination. The patient was a boy with lipoid nephrosis, whose symptoms were initiated by a chill and a sudden rise in fever while under treatment for nephrosis in this hospital. Type IV pneumococci were identified in a blood culture fourteen hours later. An abdominal paracentesis done at this time yielded the same organism. No operation was performed. Serum was administered in daily doses of 180,000, 80,000, 40,000, 40,000 and 40,000 units, starting on the second day, or about fifteen hours after onset. On the first day of treatment the blood cultures were negative and agglutinins were demonstrated in the patient's serum. Improvement in the patient's condition lasted for four days and then bacteremia recurred; the patient's condition declined until the eighth day, when he died.

TABLE 5.—*Mortality Rates in Pneumococcic and Streptococcic Peritonitis*

Author	Pneumococcic Peritonitis: Year	No. of Cases	Mortality, per Cent	Streptococcic Peritonitis: Year	No. of Cases	Mortality, per Cent
Lipshutz, B., and Lowenberg, H.: J. A. M. A. **86**: 100, 1926	1926	13	100	1926	9	100
Ladd, W. E.: Pennsylvania M. J. **34**: 153, 1930	1930	15	66	1930	36	65
Donovan [3]	1934	12	75	1936	42	78
Cole [5]	1937	26	54			
Leopold and Kaufman [4]	....	..	..	1937	12	91

MORTALITY

A characteristic feature of primary peritonitis is that it has been universally accepted that it has a high mortality rate (table 5). However, when the present series of cases is divided into those in which specific therapy was and was not given, there is a striking difference in the mortality rates (table 6). It is at once evident that the total rate has been lowered more than 50 per cent. In the pneumococcic group with early operation and specific therapy there is only 12.5 per cent mortality, in contrast to 83.3 per cent in those without the advocated therapy. On the other hand the streptococcic group presents a less striking but significant drop in the mortality of 72 per cent to 28.5 per cent in the corresponding groups. As pointed out previously in this paper, the one patient with pneumococcic peritonitis and the two with streptococcic peritonitis who were given specific therapy and died were not given adequate specific treatment.

TABLE 6.—*Mortality Rates in Pneumococcic and Streptococcic Peritonitis With and Without Specific Therapy*

Children's Hospital Primary Peritonitis 1929-1939	Without Specific Therapy: Total Cases	Deaths	Mortality, per Cent	With Specific Therapy: Total Cases	Deaths	Mortality, per Cent
All primary cases...	52	38	73.0	15	3	20.0
Pneumococcic.....	12	10	83.3	8	1	12.5
Streptococcic.....	40	28	72.0	7	2	28.5

COMMENT

In the present clinical study of primary peritonitis, the benefits of early operation and adequate specific therapy have been reflected by a significant reduction in the mortality. The details of treatment remain somewhat elastic and, as pointed out elsewhere, not all of the patients were treated according to our present concept of the most effective procedure. The virulence of the organism and the resistance of the patient are two factors in primary peritonitis which always play an important role, which is difficult to evaluate in discussing the results of any type of treatment. Several cases of pneumococcic peritonitis successfully treated with sulfapyridine have been reported [10] recently. This may prove a valuable adjunct to the serum therapy of the disease.

The present program of treatment of primary peritonitis that we advocate following is as follows:

1. Early incision and drainage of the peritoneal cavity with minimal manipulation.

2. Identification as rapidly as possible of the offending organism obtained from the peritoneal cavity.

3. Immediate postoperative institution of sulfanilamide therapy by hypodermoclysis, continued by oral administration when fluids can be taken by mouth.

4. If a pneumococcus is obtained, substitution of sulfapyridine for sulfanilamide therapy and intravenous administration of type specific antipneumococcus serum.

5. (*a*) Use of high concentration oxygen and gastric siphonage to relieve abdominal distention; (*b*) maintenance of adequate fluid intake by parenteral and enteral routes; (*c*) repeated small blood transfusions to combat anemia and hypoproteinemia.

CONCLUSION

The high mortality rate in primary peritonitis can be strikingly reduced by early operation for recovery of the offending organism and drainage followed by adequate treatment with sulfanilamide in the streptococcic group and with type specific serum in the pneumococcic group.

300 Longwood Avenue.

9. Finland, Maxwell; Brown, J. W., and Rauh, H. E.: Treatment of Pneumococcic Meningitis, New England J. Med. **218**: 1033-1044 (June 23) 1938.

10. Barnett, H. L.; Hartmann, A. F.; Perley, A. M., and Reuhoff, M. D.: The Treatment of Pneumococcic Infections in Infants and Children with Sulfapyridine, J. A. M. A. **112**: 518-527 (Feb. 11) 1939.

FACTORS IN RECURRENCE OF RENAL CALCULI

CHARLES C. HIGGINS, M.D.

CLEVELAND

The recurrent formation of renal calculi following the surgical removal of a stone from the kidney constitutes a major problem in the management of patients with renal lithiasis. That formation of secondary calculi will frequently occur unless adequate preventive measures are instituted seems plausible when it is obvious that, in the majority of instances, the underlying factors associated with the production of the primary calculus are not corrected or eradicated by the surgical procedure.

From experimental and clinical observation, it appears evident that no one etiologic agent is entirely responsible for the formation of all kidney stones. This emphasizes the necessity for an intensive preoperative investigation to ascertain the causative factors in each individual case. This facilitates correction of these factors at the time of surgical treatment or during the postoperative regimen. Certainly the operative procedure per se constitutes but one phase in the management of this group of patients, and to neglect an exacting preoperative investigation and adequate postoperative supervision will be attended by an unwarranted high incidence of recurrences. It is also evident that, while an investigation of the etiologic factors is essential during the preoperative period, additional factors known to be associated with the formation of calculi may be introduced or be directly attributed to surgical intervention, namely, trauma, infection and conditions conducive to the production of stasis.

Recurrent renal calculi may be of either one of the following two types:

1. True recurrence or the formation of a calculus after complete removal of the original stone.

2. False recurrence, or a persistence of stones or fragments of a calculus overlooked at the time of operation.

A knowledge of the true incidence of these recurrences is influenced by the frequency with which postoperative roentgenograms are secured. Misinterpretation of end results cannot be avoided unless roentgen study is made as a routine procedure after the operation. A small calculus may be overlooked at the time of operation, especially if multiple stones are being removed. Unless a roentgenogram is secured before the patient is dismissed from the hospital a recurrence, either asymptomatic in type or productive of renal colic, and which is noted by roentgen studies months later, may be misconstrued as a true recurrence or a stone that formed de novo, whereas it is really a false recurrence. When multiple calculi are being removed, I believe that a roentgenogram of the exposed kidney should be secured at the time of operation in order to avoid overlooking a small stone.

It is evident from the contributions of several authors that a progressive decrease in the incidence of recurrent renal calculi is taking place. In 1915 Cabot and Crabtree,[1] in reviewing the results secured in the treatment of renal calculi at the Massachusetts General Hospital, reported that "recurrence" took place in 56 per cent of patients treated by nephrotomy and in 51 per cent of those treated by pyelotomy.

Barney[2] in 1922 again studied a series of cases from the Massachusetts General Hospital and stated that the incidence of recurrence was 32 per cent following the removal of a calculus from the kidney; however, it is interesting to note that postoperative roentgenograms revealed that stones were still present in the kidney in nine of twenty cases, or 45 per cent.

Braasch and Foulds[3] in 1924 stated that calculi recurred in 10.79 per cent of the patients who were operated on at the Mayo Clinic. Herbst[4] has noted the incidence of recurrence as 15 per cent, while Hunner[5] in 1927 gave the incidence as 9.5 per cent following operations for renal stones and as 4.4 per cent following operations for ureteral calculi.

Oppenheimer[6] in 1937 cited true recurrences following pyelolithotomy, pyelonephrolithotomy and nephrotomy in 14.9 per cent, 32.0 per cent and 29.4 per cent, respectively, of his cases.

Twinem[7] in 1937 reviewed 314 operations for stone performed at the New York Hospital and stated that there were 28 per cent recurrences following nephrotomy and 20.9 per cent following pyelotomy. During the preceding year and a half, however, he stated that recurrences had been reduced to 5.3 per cent. At the Cleveland Clinic the incidence of recurrence prior to 1933 was 16.4 per cent. Between the years 1933 and 1939 this has been reduced to 4.9 per cent by adding the high vitamin A acid ash or alkaline ash diet to the other postoperative measures, thereby controlling the p_H of the urine.

INFECTION

The relationship between infection and the formation of primary or recurrent calculi has been stressed for a long time. Brongersma's[8] statistics illustrate the relationship between infection and recurrent renal lithiasis. In the absence of infection the incidence of recurrence was between 3 and 6 per cent, but it was approximately 27 per cent when the infection was slight and 50 per cent when severe.

Rovsing[9] found that 68.18 per cent of all recurrences occurred when renal infection, either primary or secondary, was due to urea-splitting organisms. However, in 15.91 per cent of his cases the recurrences developed in the presence of sterile urine. Ten examples of renal stone due to the staphylococcus were reported by Boshamer[10] in 1932. The formation of these calculi was probably due to the ability of certain members of this group to split the urea in the urine with the resultant formation of ammonia, a reaction favorable to the precipitation of the alkaline salts in the urine. In 1935 Runeberg[11] stressed the importance of anaerobic organisms in the genesis of calculi.

From the Cleveland Clinic.

Read before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

1. Cabot, Hugh, and Crabtree, E. G.: Frequency of Recurrence of Stone in the Kidney After Operation, Surg., Gynec. & Obst. **21:** 223-225, 1915.

2. Barney, J. D.: Recurrent Renal Calculi, Surg., Gynec. & Obst. **35:** 743-748 (Dec.) 1922.

3. Braasch, W. F., and Foulds, G. S.: Postoperative Results of Nephrolithiasis, J. Urol. **11:** 525-537 (June) 1924.

4. Herbst, R. H.: Recurrent Renal Calculus: Its Cause and Prevention, Am. J. Surg. **12:** 58-62 (April) 1931.

5. Hunner, G. L.: Calculus of Upper Urinary Tract Treated by New Methods; End Results, Tr. South. S. A. **40:** 1-17, 1927.

6. Oppenheimer, G. D.: Nephrectomy versus Conservative Operation in Unilateral Calculous Disease of the Upper Urinary Tract, Surg., Gynec. & Obst. **65:** 829-836 (Dec.) 1937.

7. Twinem, F. P.: Study of Recurrence Following Operations for Nephrolithiasis, J. Urol. **37:** 259-267 (Feb.) 1937.

8. Brongersma, cited by Joly.[38]

9. Rovsing, C. M., cited by Fowler, H. A.: Cococcus Infection of Kidney; Its Role in Formation and Recurrence of Stone, Urol. & Cutan. Rev. **38:** 594-605 (Aug.) 1934.

10. Boshamer, K.: Staphylokokkensteine der Nieren, München. med. Wchnschr. **79:** 1951-1953 (Dec. 2) 1932.

11. Runeberg, B.: Anaerobic Bacteria in Urine and Urinary Calculi, Finska läk.-sällsk. handl. **77:** 737-746 (Dec.) 1935.

A study of a series of 200 patients with recurrent renal calculi made at the Cleveland Clinic showed a coexisting renal infection in 81.5 per cent of the cases (figs. 1, 2 and 3), while the urine was sterile in 18.5 per cent (fig. 4). It was noted that when the stones were large an infection was usually present, while the urine was more frequently sterile in the presence of smaller calculi.

Determination of the chemical constituents of stones formed in the presence of sterile urine showed them usually to be composed of uric acid, cystine or oxalates, while the recurrent stones associated with renal infection were generally composed of phosphates, carbonates or mixtures of these salts with occasional traces of oxalates.

In considering the relationship of infection to recurrence, two types of infection must be considered. If the organisms possess the power of splitting urea, such as Bacillus proteus, there is a greater tendency for a recurrent calculus to develop than when the infection is due to Bacillus coli, an acid-forming organism which does not possess this power. This requires further elucidation, however, since the reports of Brown and Earlam [12] in 1933. These authors stated that 18 per cent of the bacilli which infect the urinary tract possess the power of splitting urea and that 40 per cent of Staphylococcus albus have similar properties. These organisms split the urea in the urine with the resultant formation of ammonia and carbon dioxide. This shifts the p_H of the urine to the alkaline side, enhancing the precipitation of the alkaline salts, i. e. phosphates and carbonates.

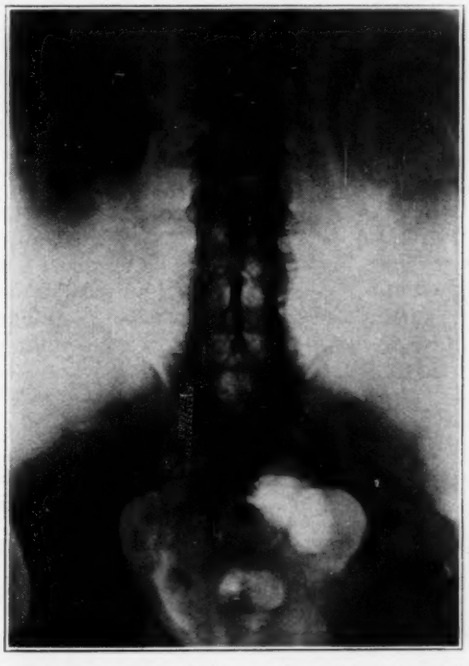


Fig. 1.—Recurrent renal calculi associated with proteus infection.

In the present series of cases, 9 per cent of the bacilli and 18 per cent of the staphylococci possessed this power. It was also noted that infection of the kidneys was much more frequent in the patients with bilateral recurrent renal calculi than in those with unilateral stones. The predominant organism cultured was Staphylococcus albus. It was found most frequently in pure culture and usually was present in the mixed infections. Bacillus proteus in pure culture was the second chief offender, although other bacilli and streptococci in mixed cultures were often observed.

As the selection of medication employed to eradicate the renal infection may be influenced by knowledge as to whether the organisms split urea—and, in fact, certain drugs such as ammonium chloride may be contra-

Fig. 2.—Recurrent renal calculi associated with colon bacillus infection, the organism having the power of splitting urea.

indicated in the presence of a proteus infection—it should be a routine part of one's bacteriologic study to determine whether the offending organisms have the power of splitting urea. Similarly, in addition to a culture, a stained smear of the urinary sediment should be made in each case. While it appears true that infection plays a major role in the production of recurrent renal calculi, in view of the clinical observation that many recurrences develop in the presence of sterile urine, further search for etiologic factors is essential.

FOCAL INFECTION

In 1921 Rosenow and Meisser [13] presented their experimental data which indicated the role of focal infection in the formation of renal calculi. They inoculated the pulps of the teeth of dogs with streptococci isolated from the urine of patients with renal lithiasis. Following this, calculi developed in the dogs and streptococci were again isolated from the urine.

In reviewing the present series of 200 recurrent renal calculi, definite foci of infection could be demonstrated in many instances, but there was no apparent relationship between the organisms cultured from these sites and those isolated from the urine. In view of the work of Rosenow and Meisser, however, I believe that foci present in the teeth, tonsils, cervix and prostate should be eliminated.

STASIS

Urostasis in many instances seems definitely to be associated with the formation of recurrent renal calculi, and its presence is conducive to shifting the p_H of the

12. Brown, R. K. L., and Earlam, M. S. S.: Relation of Prolonged Immobilization and Urinary Tract Infection to Renal Calculous Formation, Australian & New Zealand J. Surg. **3**: 157-171 (Oct.) 1933.

13. Rosenow, E. C., and Meisser, J. G.: Nephritis and Urinary Calculi After Experimental Production of Chronic Foci of Infection, Collected Papers of Mayo Clinic **13**: 253-257, 1921.

urine to the alkaline side. Hunner [14] in 1924 stressed the importance of ureteral stricture in the formation of renal calculi.

In this series the intravenous urogram revealed evidence of stasis in 72 per cent of the cases. Either the calculus was producing varying degrees of obstruction at the ureteropelvic junction or obstruction was demonstrated in a calix containing the stone. It is difficult from the analysis of this group of cases to form an opinion as to whether stasis preceded the formation of the recurrent calculus or was produced subsequent to the formation of the calculus. In twenty-one instances a stone formed in the kidney following the surgical removal of a stone from the ureter on the same side (figs. 5 and 6).

Intravenous urograms in this group elicited definite evidence of ureteral obstruction at the site at which the calculus was removed in twelve instances. This serves to emphasize the value of employing intravenous urographic studies following the removal of a calculus from the ureter. These recurrences could probably have been prevented by dilation of the ureter and adequate care in the postoperative regimen.

VITAMIN A DEFICIENCY

Experimental and clinical observations demonstrating the relationship between a deficiency of vitamin A in the diet and the formation of renal calculi have been discussed previously.[15] Some authors have stated that there is no evidence of deficiency of vitamin A among the people of this country. This presumption is based

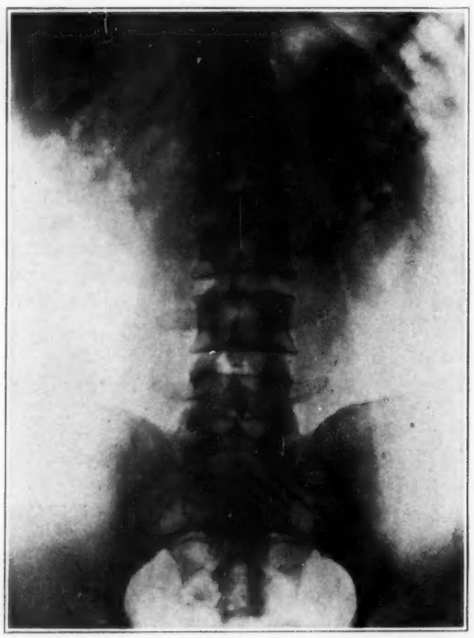


Fig. 3.—Recurrent renal lithiasis associated with Staphylococcus albus infection, the organism having the power of splitting urea.

on impressions gained only from dietary histories elicited from the patients and may lead to erroneous deductions. The history alone does not provide sufficient evidence to state whether a person is receiving or utilizing adequate amounts of vitamin A, and biophotometric studies have shown how unreliable such information may be.

In previous communications I [16] have noted that from 68 to 72 per cent of patients with renal calculi had a positive reaction to the biophotometer test, and in this study of patients with recurrent renal calculi 48 per cent had various degrees of vitamin A deficiency as shown by this method.

Dr. W. J. Ezickson [17] in a personal communication stated: "There were twenty-five patients in our first

Fig. 4.—Recurrent renal calculus. Urine sterile.

series who have or have had renal calculi who were studied for vitamin A deficiency by means of the dark adaptation test. Twenty-four of these showed a pathological dark adaptation and only one was normal."

Jeghers [18] stated: "More important, however, was the demonstration of the frequency of clinically detectable vitamin A deficiency in a group of 162 students examined. Of this group, 35 per cent had low photometric readings and 12 per cent had clinical manifestations of vitamin A deficiency." Youmans, in discussing Jeghers' paper, stated that when using a similar photometric test he found subnormal dark adaptation in one half of fifty clinic patients, the diets of many of whom were thought to be inadequate. In eleven of fifty-four supposedly normal subjects whose diets appeared to be well balanced a similar observation was made.

From these reports and those of Jeans [19] and others it appears evident that varying degrees of vitamin A deficiency are more prevalent in this country than we have been led to believe. Vermooten [20] stated that calculi do not form in the South African Negro, as illustrated by a study of 1,091,000 Negro patients. According to his report the South African Negro lives

14. Hunner, G. L.: Ureteral Stricture: Report of Unusual Case Illustrating Influence on Formation of Urinary Calculi, J. A. M. A. **82:** 509-516 (Feb. 16) 1924.

15. Higgins, C. C.: Experimental Production of Urinary Calculi, J. Urol. **29:** 157-185 (Feb.) 1933; Production and Solution of Urinary Calculi, J. A. M. A. **104:** 1296-1298 (April 13) 1935.

16. Higgins, C. C.: Factors Which Influence the Formation of Urinary Calculi; Clinical Application to Prevention of Recurrent Renal Calculi, New York State J. Med. **36:** 1620-1628 (Nov. 1) 1936; Present Status of Dietary Regimen in Treatment of Urinary Calculi, Brit. J. Urol. **9:** 36-46 (March) 1937.

17. Ezickson, W. J., and Feldman, J. B.: Signs of Vitamin A Deficiency in the Eye Correlated with Urinary Lithiasis, J. A. M. A. **109:** 1706-1710 (Nov. 20) 1937.

18. Jeghers, Harold: Degree and Prevalence of Vitamin A Deficiency in Adults, with Note on Its Experimental Production in Human Beings, J. A. M. A. **109:** 756-762 (Sept. 4) 1937; correction, September 18, p. 965.

19. Jeans, P. C., and Zentmire, Zelma: Prevalence of Vitamin A Deficiency Among Iowa Children, J. A. M. A. **106:** 996-997 (March 21) 1936.

20. Vermooten, Vincent: Occurrence of Renal Calculi and Their Possible Relation to Diet as Illustrated in South African Negro, J. A. M. A. **109:** 857-859 (Sept. 11) 1937.

on a simple, stable diet which is rich in vitamin A, high in acid-ash base and extremely low in calcium.

I believe therefore that a biophotometer test to determine the absence or presence of vitamin A deficiency should be a part of the examination of every patient with calculous disease (fig. 7). Furthermore, my associates and I prescribe vitamin A as a routine in the postoperative course for two reasons: first, to correct vitamin A deficiency if it is present and, second, for its effect on the epithelial structures.

HYPERPARATHYROIDISM

Albright and Bloomberg,[21] Barney and Mintz [22] and others have stressed the relationship between hyperparathyroidism and renal lithiasis. Barney and Mintz in 1934 reported a series of eighteen cases in which a diagnosis of hyperparathyroidism had been made and verified by surgical intervention. In eleven (61.1 per cent) calculi were present in the urinary tract. The youngest patient was 13 years of age and the oldest was 62. Involvement of the bones to varying degrees was present in twelve cases, while in six others urinary calculi and changes in the bones were found to coexist. The renal calculi were bilateral in four (36 per cent) of the eleven cases. Barney and Mintz conclude that hyperparathyroidism is responsible for from 4 to 5 per cent of the cases of renal calculi. In almost 70 per cent of cases of hyperparathyroidism stones may be present, while in approximately 38 per cent the patients have

Fig. 5.—Stricture of right ureter following ureterolithotomy. Note stasis demonstrable by intravenous urogram.

changes in the bones and urinary tract. Barney and Mintz state and Albright and Bloomberg concur that hyperparathyroidism is so frequently a cause of renal lithiasis that in every patient with this condition it must be determined whether or not it is present. Therefore a careful study of the calcium and phosphorus content of the blood should be made in all patients with renal stones.

21. Albright, Fuller, and Bloomberg, Esther: Hyperparathyroidism and Renal Disease, with Note as to Formation of Calcium Casts in This Disease, Tr. Am. A. Genito-Urin. Surgeons **27:** 195-202 (May 15) 1934.
22. Barney, J. D., and Mintz, E. R.: Some Newer Conceptions of Urinary Stone Formation, J. A. M. A. **103:** 741-743 (Sept. 8) 1934.

Griffin, Osterberg and Braasch,[23] in reviewing cases of urinary lithiasis at the Mayo Clinic, state that hyperparathyroidism was found to be an etiologic factor in less than 0.2 per cent of their cases. At the Cleveland Clinic, hyperparathyroidism has been associated with renal lithiasis in about 0.1 per cent of the cases. In one case in this series the presence of hyperparathyroidism was overlooked when the primary calculus was

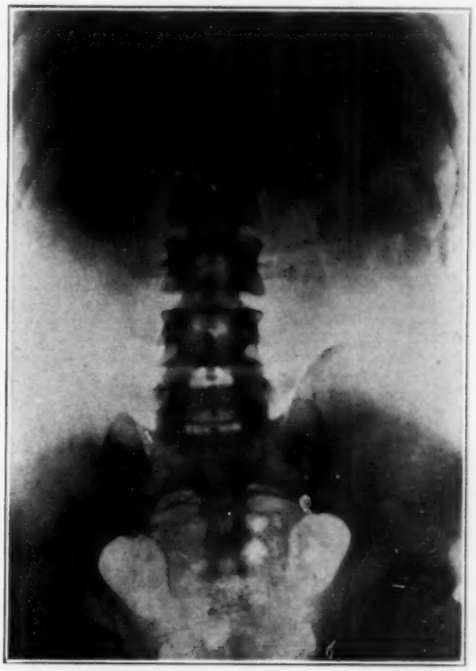


Fig. 6.—Formation of renal calculus on the same side two years later.

removed. When the patient returned with a recurrent renal calculus a diagnosis of hyperparathyroidism was established and verified by blood studies. A tumor of the parathyroid glands was removed at the time of operation. Further recurrences have not developed.

Gilmour and Martin [24] have emphasized the relationship between the condition of the parathyroid glands and renal disease. Fowweather and Pyrah [25] in 1938 also studied the relationship between hyperparathyroidism and renal lithiasis. They noted the absence of any marked preponderance of high levels of blood calcium among cases of recurrent calculi as compared with those without recurrence. They state: "Hence the raised blood calcium which may be found in association with renal calculi is in general the result of renal damage, and the previous suggestions that it is not evidence of a primary hyperparathyroidism, which is the cause of the formation of calculi, is confirmed."

They state further that in the early stages of renal disease the response of the parathyroid glands to this stimulus may result, in a certain proportion of cases and for a certain length of time, in an enhanced activity of these glands, which is rather more than sufficient to counteract the tendency arising from renal disease, so that a raised blood calcium and to a less extent a reduced blood phosphorus make their appearance. As the renal disease progresses, the tendency toward a low

23. Griffin, Miles; Osterberg, A. E., and Braasch, W. F.: Blood Calcium, Phosphorus and Phosphatase in Urinary Lithiasis; Parathyroid Disease as Etiologic Factor, J. A. M. A. **111:** 683-685 (Aug. 20) 1938.
24. Gilmour, J. R., and Martin, W. J.: Weight of Parathyroid Glands, J. Path. & Bact. **44:** 431-462 (March) 1937.
25. Fowweather, F. S., and Pyrah, L. N.: Renal Calculi, Renal Disease and Hyperparathyroidism, Proc. Roy. Soc. Med. **31:** 593-604 (April) 1938.

blood calcium and a high blood phosphorus appears to increase to a point beyond which it is impossible for the parathyroids to neutralize it, and thus the blood changes of advanced renal disease are evident. Thus careful selection must be made of patients in whom exploratory operation on the parathyroid glands is advised. It is true, however, that the possibility of hyperparathyroidism must be considered in all patients with renal lithiasis, and no preoperative investigation is complete without due consideration of this disease.

METABOLIC FACTORS

Cystinuria.—This is a familial disease which results from derangement of the intermediate protein metabolism of the body. In normal persons cystine is oxidized completely and the sulfur is excreted as a sulfate. It is stated that calculi develop in about 2.5 per cent of patients suffering from cystinuria (fig. 8). However, Seeger and Kearns [26] in 1925 collected 181 cases of

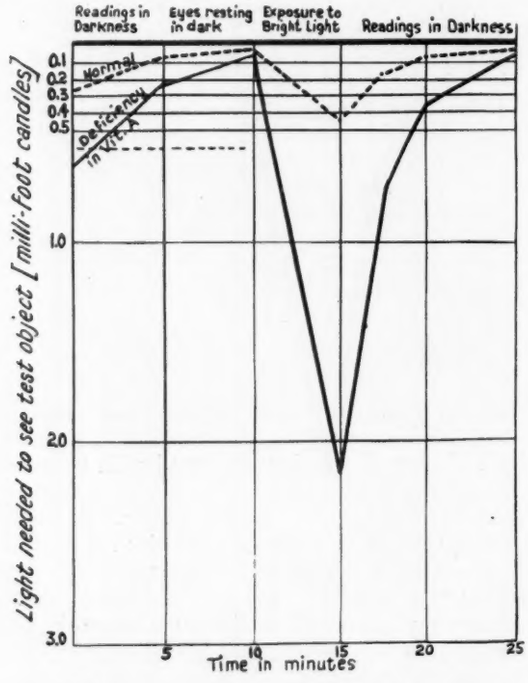


Fig. 7.—Biophotometric reading on a patient with recurrent renal calculi. Note the return to normal when adequate amounts of vitamin A were administered.

cystinuria, 124 of which were complicated by stone formation. Cystine may be found in the urine partly in solution and partly as a crystalline deposit. A diagnosis of cystinuria is made in the majority of cases by a microscopic examination of the urinary sediment. Treatment consists of increasing the solubility of the cystine in the urine by the administration of alkalis and by restriction of the protein intake. Maintenance of an alkaline reaction of the urine diminishes definitely the possibility of the formation of a calculus.

Gout.—Gout is another metabolic disease in which excessive amounts of crystalloids appear in the urine, microscopic examination of the sediment revealing the presence of uric acid crystals and urates. Not only may calculi composed of uric acid be produced, but the patient may experience attacks of colic as showers of uric acid crystals are passed. Other clinical manifestations of gout need not be present for uric acid calculi to form. Normally, in man, from 0.3 to 1.2 Gm. of uric acid is excreted daily. The amount excreted is influenced by the diet of the individual. Postoperatively, a low purine diet in conjunction with the high vitamin A alkaline ash diet assists in minimizing the incidence of recurrent formation of this type of calculus.

Oxaluria.—Oxaluria has been stated by Neville [27] to be associated with a deficiency of vitamin B. Oxalic acid, which has both an exogenous and an endogenous source, is excreted in the urine in amounts of approximately 15 to 20 mg. daily. Experiments have indicated that, if an animal is maintained on a diet containing a fixed amount of calcium oxalate, the amount of the urinary oxalate can be increased by the administration of acids and decreased by alkalis. If the calculus is found to be composed of oxalates, the foods having a high oxalic acid content should be restricted in the postoperative regimen.

Xanthine.—Urinary calculi composed of xanthine are of rare occurrence. Kretschmer [28] in 1937 collected a series of fifteen cases and added one of his own. Mathews [29] states that the most important purine found in the human urine is uric acid, but there are present also from 30 to 50 mg. of purine bases—xanthine, hypoxanthine, guanine and adenine. He estimates that from 16 to 60 mg. of purine bases are eliminated in the urine daily as the purines are the end products of the metabolism of the nucleins. Postoperatively, foods with a high purine content should be restricted if the calculus is composed of xanthine.

Phosphaturia.—The type of phosphaturia present must be determined. Temporary phosphaturia may be caused by eating foods containing an excess of alkaline ash. Permanent, infected phosphaturia is associated with the presence of an organism that has the power of splitting urea. In this type the urea is transformed into ammonium carbonate, the ammonia then combining with the magnesium and phosphoric acid to form triple phosphate, while the carbonate combines with the calcium, forming calcium carbonate. Permanent, noninfected phosphaturia is stated to be due to alteration in function of the gastrointestinal tract.

Snapper [30] believes that all factors which tend to stabilize the labile colloids must help prevent the formation of stones. The presence of salicylates, mandelates, hippurates and other organic salts in the urine may, by increasing the stability of the urinary colloids, exercise a prophylactic influence against the formation of stones. He states:

> Factors which may have a preventive or even a curative effect on the formation of renal calculi are:
>
> 1. Administration of foods with an acid-ash which increases the acidity of the urine and the solubility of the calcium salts.
> 2. Artificial acidosis by ingestion of ammonium chloride, ammonium nitrate, or other compounds.
> 3. Large supply of vitamin A.

Residues of kidney stones and urinary gravel may be prevented by the use of these measures. It is also evident that the presence of hippurates, salicylates, mandelates and other organic salts in the urine must be of great importance in the prevention of renal stones.

TRAUMA

A review of the literature indicates that recurrences following nephrolithotomy and nephropelviolithotomy are more frequent than when pelviolithotomy is

26. Seeger, S. J., and Kearns, W. M.: Cystinuric Lithiasis, J. A. M. A. **85**: 4-7 (July 4) 1925.

27. Neville, D. W.: Constitutional Factor in Oxaluria, Urol. & Cutan. Rev. **39**: 32-33 (Jan.) 1935.

28. Kretschmer, H. L.: Xanthin Calculi, Report of Case and Review of Literature, J. Urol. **38**: 183-193 (Aug.) 1937.

29. Mathews, A. P.: Physiological Chemistry, ed. 5, New York, William Wood & Co., 1930, pp. 764, 1175.

30. Snapper, I.: Pathological Physiology of Secretion of Urine, Proc. Internat. Cong. Urol., 1936, pp. 575-617.

employed. In nine cases in this series a blood clot was found to be the nucleus for a recurrent stone. Braasch and Foulds [3] in 1924 estimated a recurrence of 10.79 per cent, a recurrence of 11.85 per cent following pyelotomy and 24.03 per cent following nephrolithotomy. Certainly a minimum of trauma should be inflicted during the surgical procedure, and a pelviolithotomy should be performed whenever possible.

TYPE OF STONES

The surgical removal of a branched stone extending into the calices is more likely to be followed by a recurrence than when a smaller stone is removed which is confined to the pelvis of the kidney. This may be due to injury of the calix or infundibulum, allowing blood clots to remain behind, subsequent development of stricture of the infundibulum which is conducive to stasis in the calix and later infection, or a small stone or fragment of a stone may be overlooked in one of the calices.

It is apparent that the removal of multiple calculi from the kidney is attended by a greater increase of recurrence than when a solitary stone is removed. Frequently a small calculus or a fragment which may not even be discernible on the roentgenogram has been removed by a suction apparatus which we employ as a routine following the removal of a stone from the kidney. Similarly, if a coexisting infection is present in the kidney, especially of a staphylococcus or proteus bacilli, the incidence of recurrence following operation is more than when culture of the urine is sterile.

In a similar manner, stones of soft consistency are more prone to be followed by a recurrence, possibly because sand remains to act as a nucleus for secondary formation. After removal of a calculus from the kidney, thorough lavage of the calices and pelvis followed by suction with the apparatus I have previously described will minimize the incidence of recurrent stone formation.

SURGICAL ASPECTS OF PREVENTION

There is little doubt that the surgical procedure which is accompanied by a minimum degree of trauma to the kidney is preferable. I do not believe that as a routine the kidney should be manhandled, traumatized and delivered into the incision in removing a stone from its pelvis. Rather, the operative procedure should be carried down to the pelvis of the kidney and adequate exposure secured by use of flexible retractors without delivering the kidney. In instances in which there is no coexisting renal infection or, if it is not pronounced, the incision in the pelvis should be closed with triple 0 catgut sutures passing only through the outer coats of the pelvis and not through the mucosa, where it might be retained and act as a nucleus for a recurrent calculus.

Joly [31] has stated that even temporary leakage of urine increases the risk of recurrence of stone and should be avoided if possible. He likewise believes that if the kidney has been drained it is usually found to be infected with Staphylococcus albus. Similarly, Rovsing [10] has stated that urinary leakage of only a few days duration is sufficient to infect the kidney. In cases, however, in which a pronounced infection is present, it may be advisable to perform a nephrostomy, or a catheter may be left directly in the pelvis to permit lavage and facilitate adequate drainage.

Nephrolithotomy is employed only when pelviolithotomy does not seem feasible. In all cases it should be as conservative as possible. When a calculus is confined to a calix and the infundibulum is too narrow to permit its extraction through the pelvis, a localized nephrolithotomy is advisable. Again, in the removal of staghorn stones, nephrolithotomy may be necessary, and I believe that adequate drainage should be instituted in these cases.

A pelvionephrolithotomy, in my experience, is seldom necessary, and only if technical difficulties arise.

A heminephrectomy may be the preferable operative procedure in some instances in which a calculus is confined to a large, dilated calix. In the presence of a stricture of the infundibulum and infection of the calix, the latter can be eradicated only by this procedure, and fewer recurrences will follow this method than if a localized nephrotomy is done. Likewise, the remaining portion of the kidney is saved from the ravages of infection.

Fig. 8.—Recurrent renal and bladder calculi in a patient with cystinuria.

Again I wish to stress the importance of thoroughly lavaging the pelvis and calices followed by the use of a suction tube again placed in the pelvis and calices to remove clots, débris, fragments of stones or minute stones and sand that might be overlooked.

CONCLUSIONS

It is apparent that many factors may be associated with the formation of recurrent renal calculi. An intensive preoperative investigation is required in each individual case to ascertain the factor or factors instrumental in the production of the primary calculus. Their correction and eradication at the time of operation or in the postoperative routine is rewarded by a reduction in the incidence of recurrence. In addition to eradication of the various etiologic agents, control of the p_H of the urine by the high vitamin A acid ash or alkaline ash diet, depending on the chemical constituents of the stone removed at the time of operation, has been attended by a pronounced decrease in the incidence of recurrent formation of calculus in our hands.

2020 East Ninety-Third Street.

31. Joly, J. S.: Stone and Calculous Disease of the Urinary Organs, St. Louis, C. V. Mosby Company, 1929.

CALCIUM AND PHOSPHORUS EXCRETION IN THE URINE

OF PATIENTS WITH RENAL OR URETERAL CALCULI

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Many workers have indicated the possibility that the increased urinary concentration of calcium and phosphorus associated with certain generalized conditions such as hyperparathyroidism,[1] bone disease and fractures[2] may be an important factor in calcium urolithiasis. However, little quantitative work on this concentration in patients with urinary calculi is available.

Since on theoretical, experimental[3] and clinical grounds it would seem that increased urinary concentration of calcium and phosphorus should be an important factor in the formation of stone, it was felt that a quantitative study of the urinary calcium and phosphorus in all types of patients with calcium urolithiasis and the quantitative differences in this factor as the result of treatment would be of significance from an etiologic, prognostic and therapeutic point of view. It is my purpose in this paper to present the results of such a study in a series of thirty-five consecutively admitted patients with renal or ureteral calculi.

SUBJECTS

Thirty-five consecutively admitted patients with calcium stones in the kidneys or ureters form the basis of this study. Their ages ranged from 19 to 70 years, but the vast majority were from 20 to 40 years of age. Twenty-two of them were men and thirteen were

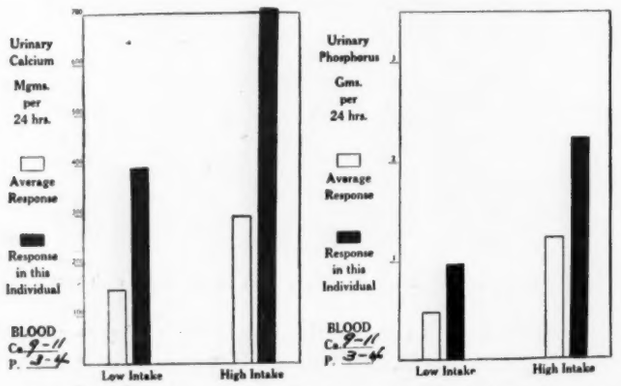

Fig. 1.—Urinary excretion of calcium and phosphorus by a white man aged 21 with a calcium oxalate stone in the right ureter. The PH of the urine was 5.5. At the present time the patient shows very high urinary excretions of calcium on both low and high intakes. Note that the excretion of phosphorus is also moderately increased, but not as markedly as the calcium. Compare this response to the fixed diets with that illustrated in figure 2.

women. All of them except one, who had generalized atrophic arthritis, were ambulatory during the course of the studies. Of the ambulatory patients, one was in the late stages of Paget's bone disease. Only one presented vitamin A deficiency, although twenty of them were studied by means of the Jeans biophotometer test. This deficiency was speedily rectified by the administration of vitamin A. Two patients presented hyperparathyroidism, as evidenced by increased serum calcium, decreased serum phosphorus and increased urinary calcium. Neither had bone changes. A parathyroid adenoma was subsequently removed from one of them. Four months after operation this patient continued to excrete large quantities of calcium in the

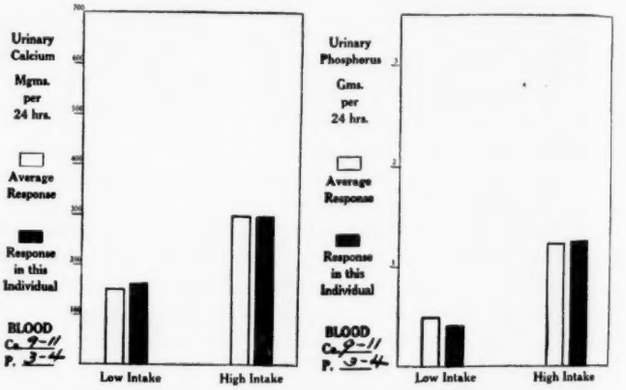

Fig. 2.—Urinary excretion of calcium and phosphorus by a white woman aged 43 with left renal stone. There was a history of hyperthyroidism with subtotal thyroidectomy eleven years previous to admission. At present the patient has essentially normal urinary excretion of calcium and phosphorus. Compare this response to the fixed diets with that illustrated in figure 1.

urine, although the blood calcium and phosphorus levels, which had returned to normal immediately after operation, were still normal. The other patient refused operation, so that direct proof of parathyroid disease was lacking. All the patients suffered from some slight infection of the urinary tract, as evidenced by the finding of an occasional pus cell in the urine, but none of them had outspoken urinary sepsis. Organisms were found in the urines of all patients. These were Staphylococcus albus and aureus, Bacillus proteus, Bacillus coli and Staphylococcus haemolyticus either alone or together. No fevers, colds or other intercurrent infections were noted. In addition, twelve volunteers without any evidence of stone or other abnormalities were used as controls.

METHODS AND RESULTS

Metabolic studies including accurate weighing and analysis of all food and water ingested and of all urine excreted were carried out on each patient. Since four different methods of attack were used, the individual methods will be described in the appropriate section.

EFFECT OF DIETS WITH HIGH AND WITH LOW CALCIUM AND PHOSPHORUS CONTENT AND WITH NEUTRAL ASH

In order to ascertain whether or not there is an excessively high concentration of calcium and/or phosphorus in the urine of patients with calculus, each of the thirty-five subjects as well as the twelve normal volunteers was placed successively on (*a*) a diet low in calcium and phosphorus, with a daily intake of 0.3 and 0.8 Gm. respectively and producing a neutral ash and (*b*) a diet high in calcium and phosphorus with a daily intake of 2.5 Gm. of each and producing a neutral ash. Each diet was fed identically to each patient and control for a six day period. The daily fluid intake was identical for each subject and control and was limited to 2,000 cc.

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Dr. N. G. Alcock of the Department of Urology and Dr. Kate Daum of the Department of Nutrition of the State University of Iowa College of Medicine gave the author valuable aid and discussed this subject with him during the course of this study.

1. Barney, J. D., and Mintz, E. R.: The Relation of the Parathyroid Glands to Urinary Lithiasis, J. Urol. **36**: 159-167 (Aug.) 1936.

2. Jones, R. W., and Roberts, R. E.: Calcification, Decalcification, and Ossification, Brit. J. Surg. **21**: 461-499 (Jan.) 1934. Holmes, R. J., and Coplan, M. M.: Extensive Bilateral Renal Calculosis of Rapid Development Following Fracture of the Vertebrae, South. M. J. **27**: 228-233 (March) 1934.

3. Keyser, L. D.: Recurrent Urolithiasis: Etiologic Factors and Clinical Management, J. A. M. A. **104**: 1299 (April 13) 1935.

Repeated studies of seven patients were made at intervals of several months and in each instance the results were essentially the same.

In eleven of the control group of twelve volunteers the average calcium excretion, as might be expected, varied with the diet, being from 100 to 150 mg. a day on the low intake and from 250 to 300 mg. a day on the high intake. One of the "normal" controls showed an excretion of 220 mg. of calcium a day on the low intake and 460 mg. on the high intake.

The thirty-five patients with stone, however, very definitely divided themselves into two groups (figs. 1 and 2): Group 1, a large one consisting of twenty-three of the thirty-five patients, showed an increased or high urinary excretion of calcium; group 2, a comparatively small one consisting of twelve of the thirty-five patients, showed either a normal or a low urinary excretion of calcium. The phosphorus excretion in all the patients, with one exception, was essentially normal for each diet. The one exception showed a high phosphorus excretion associated with a high calcium excretion.

All of the first group of twenty-three patients excreted more than 420 mg. of calcium a day on the diets rich in calcium and phosphorus, and a daily cal-

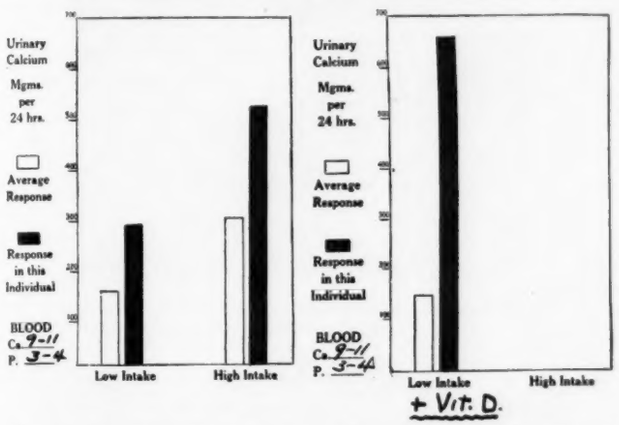

Fig. 3.—Urinary excretion of calcium by a white man aged 28 with bilateral renal calculi and recurrent renal calculi on the right. No hyperparathyroidism was present. The stones were calcium phosphate. Urinary calciums were studied repeatedly over a period of eighteen months and remained persistently high, while urinary phosphorus remained normal. Note the marked increase in urinary calcium when vitamin D in moderate doses was added to the neutral ash diet low in calcium and phosphorus.

cium excretion of more than 600 mg. was not uncommon. These values are comparable to those seen in hyperparathyroidism. Twenty-one of these patients excreted more than 200 mg. a day, but the remaining two excreted less than 200 mg. on the low intake diets. Both of the patients with hyperparathyroidism were in this group of subjects with excessive output of urinary calcium. Moreover, it is of especial interest that all those patients (ten of the thirty-five) with rapidly developing stones or with rapid formation of new stones fell into this group.

Of the group of twelve patients with normal or subnormal urinary excretion of calcium three presented a history which suggested that at the time when the urinary calculi originated there was probably an increased urinary excretion of calcium or phosphorus. There was neither a history nor indications in the remaining nine cases to suggest such a contingency. However, in none of these cases at the time these studies were made was there evidence of rapid growth of stones or of new formation of stones, and in three of them kidney stone had been known to be present and quiescent over a period of years.

To review, then, in a group of thirty-five patients with urinary calculi twenty-three showed excessive excretion of calcium in the urine. Because the excess over normal was exaggerated on the high intake, this excessive excretion could be demonstrated most readily by noting the response of the urinary calcium to the

Fig. 4.—Appearance of plain x-ray film in a case of right renal stone in a white man aged 64.

high calcium and phosphorus intake. Only two of these twenty-three had hyperparathyroidism. In the other twenty-one no definite reason for the excessive urinary calcium was to be found. Moreover, all patients showing rapidly forming stones or new stone formation while under observation showed high urinary calcium excretion. Also of the twelve patients with a low urinary

Fig. 5.—Excretory pyelograms of same patient as in figure 4. Note that there is good renal function bilaterally with practically no distortion of the right pelvis. The calcium concentrations in the kidney urines were 36 mg. per hundred cubic centimeters on the right and 18 mg. on the left. The phosphorus concentrations were 76 mg. on the right and 43 mg. on the left.

calcium three gave a history of a condition associated with increased urinary calcium at the time when the urinary calculi probably originated. Thus a marked increase in excretion of urinary calcium was demonstrable at one time or another in twenty-six of the thirty-five subjects with urolithiasis.

THE EFFECT OF DIETS WITH AN ACID ASH

The fact that calcium phosphate does not precipitate readily at a low urinary p_H has caused many workers [4] to emphasize the necessity of keeping the urinary p_H low in these patients in order to prevent recurrence of renal calculi and possibly dissolve a certain number of them. For this reason diets with a high acid ash supplemented by substances such as ammonium chloride and ammonium nitrate have been advocated. However, Albright [5] and others [6] have emphasized the fact that the ingestion of acid-forming substances usually is associated with an increased calcium excretion in the urine. This, of course, would tend to neutralize the effect of the lower p_H. Therefore, in order to estimate this relationship quantitatively we studied the effect of an acid ash diet and ammonium chloride in both groups of patients, i. e. in the group with excessive urinary calcium excretion and in the group with the essentially normal or low urinary excretion of calcium. When the group with the high urinary calcium excretion was placed on an acid ash diet supplemented by 4 Gm. of ammonium chloride daily, a marked increase in urinary calcium was obtained. Thus on an acid ash diet containing 0.8 Gm. of calcium daily urinary excretions of from 400 to 450 mg. of calcium a day were obtained. In contradistinction, the group presenting the low urinary calcium showed low responses to the same diet

Fig. 6.—Appearance of plain x-ray film in a case of a normal right urinary tract and a left hydro-ureter and hydronephrosis due to a congenital stricture at the ureterovesicular junction in a white man aged 24.

and medication. Values of from 200 to 250 mg. of calcium in the urine per twenty-four hours were obtained. This is of considerable import in the treatment of patients with renal stones by means of the acid ash diet. In the first group, the group showing high urinary calcium, relatively little or no beneficial effect is to be expected from the acid ash diet. Moreover, if urea-splitting organisms are present in the urine or the slightest amount of stasis is present harmful effects,

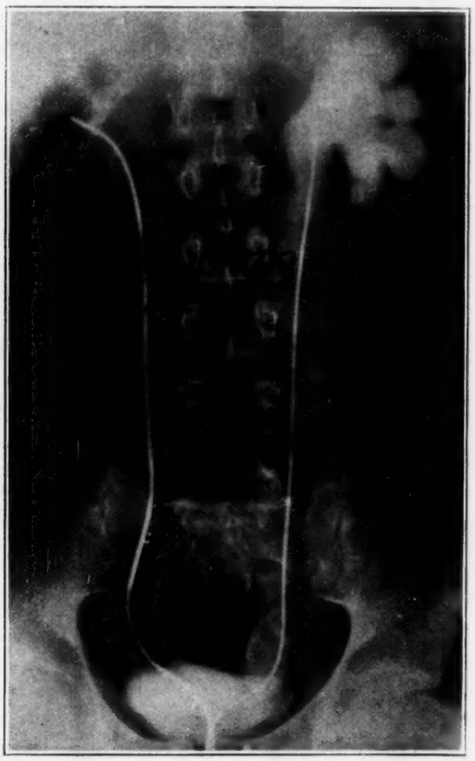

Fig. 7.—Retrograde pyelogram of same patient as in figure 6. Note that there is present a gradually enlarging left renal calculus. There is good function bilaterally. The calcium concentrations in the kidney urines were 8 mg. per hundred cubic centimeters on the right and 14 mg. on the left. The phosphorus concentrations were 8 mg. on the right and 9 mg. on the left.

such as were obtained by Oppenheimer and Pollack,[7] may result. In contrast, in the second group of patients, those showing a low urinary calcium and a low urinary calcium response to the acid ash diet, this type of diet is ideal if the desired urinary p_H can be obtained.

EFFECT OF DIETS SUPPLEMENTED BY VITAMIN D

A great many of the preparations of vitamin A are at present combined with vitamin D. Experimentally vitamin D is known to produce an increased urinary excretion of calcium. I have, therefore, studied the urinary calcium and phosphorus excretion in normal persons and also some of the patients who showed an increased urinary calcium output. The number of patients in whom complete studies were made is still quite small. However, all the patients with an increased urinary calcium excretion and renal calculi when placed on moderate doses of vitamin D showed an excessive urinary calcium response. This response was much more marked than that obtained in the normal volunteers. This finding is similar to the observations of Mawson,[8] who studied the urinary excretion of calcium in a group of tuberculous patients receiving heliotherapy (fig. 3).

4. Higgins, C. C.: Production and Solution of Urinary Calculi, J. A. M. A. **104**: 1299 (April 13) 1935.

5. Albright, Fuller; Baird, P. C.; Cope, Oliver, and Bloomberg, Esther: Studies on the Physiology of the Parathyroid Glands: IV. Renal Complications of Hyperparathyroidism, Am. J. M. Sc. **187**: 49-65 (Jan.) 1934.

6. Barney, J. D., and Sulkowitch, H. W.: Progress in Management of Urinary Calculi, J. Urol. **37**: 746-762 (June) 1937.

7. Oppenheimer, G. D., and Pollack, Herbert: Attempted Solution of Renal Calculi by Dietetic Measures, J. A. M. A. **108**: 349 (Jan. 30) 1937.

8. Mawson, E. E.: A Consideration of Some Possible Factors Concerned in the Development of Urolithiasis in Children, Liverpool Med.-Chir. J. (pt. 2) **40**: 99-133, 1932.

These significant quantitative differences in urinary calcium following the administration of high acid ash and vitamin D intakes illustrate the necessity of studying in each individual patient that patient's response to the therapy that is being instituted.

EFFECT OF URINARY STASIS

In order to ascertain the effects of urinary stasis and of other diseases of the urinary tract on the urinary excretion of calcium, studies were made on urine obtained by simultaneous catheterization of each ureter (figs. 4-9). In this way the normal kidney acted as a control for the pathologic one. Fourteen patients were studied in this manner. Although it is difficult to draw conclusions from so small a group, the trend is definite. Apparently a slight or intermittent obstruction or a slight to moderate pathologic process in the urinary tract, such as the presence of a small stone in the kidney pelvis, was associated with a significantly higher calcium concentration in the urine from that kidney than in the urine from the normal kidney. At times this concentration of calcium in the urine was twice that found in the normal mate. In contrast, complete obstruction or marked destruction of the kidney substance was always associated with a reduced calcium concentration. These observations are consistent with those of Hunner [9] and others as to the relation of stasis to urinary stones. Moreover, they emphasize the danger that a new nucleus may be formed in the kidney substance during the time consumed while waiting for a kidney stone to pass spontaneously. Also they may account for unilateral stone formation in the group of patients with a tendency to excessively high urinary calcium.

EFFECT OF VARIATION OF FLUID INTAKE

Corresponding to the results obtained by Albright, we found that the total daily urinary calcium excretion

Fig. 8.—Appearance of plain x-ray film in a case of one large and several small right renal calculi in a white man aged 45.

was quite independent of the water excretion, so that increased output of water merely diluted but did not change the calcium and phosphorus output. Therefore, the most satisfactory method for decreasing urinary calcium and phosphorus concentration is the intake of large quantities of water.

9. Hunner, G. L.: Calculus of the Upper Urinary Tract, with Special Consideration of Recurring Stone Formation, Tr. West. Branch, Am. Urol. A. **2**: 65-86, 1933.

COMMENT

Two groups of factors may be considered as fundamental in the pathogenesis of renal stone: (1) those factors which so change the nature of the renal substance as to favor precipitation of the crystalloids within it and (2) those factors which favor the precipitation

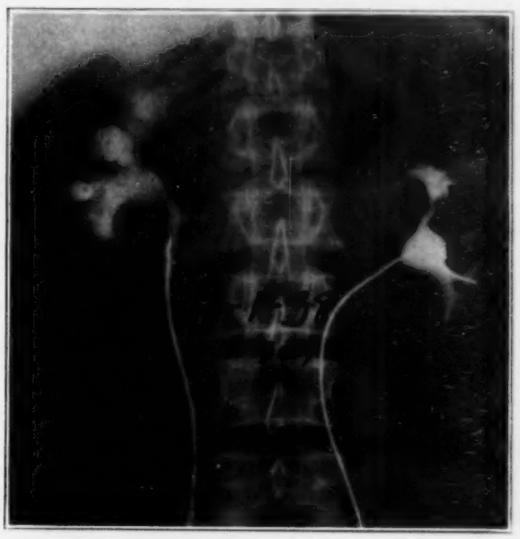

Fig. 9.—Retrograde pyelogram of same patient as in figure 8. Note that renal function was very much decreased on the right side. The concentrations of calcium in the kidney urines were 6 mg. per hundred cubic centimeters on the right and 16 mg. on the left. The concentrations of phosphorus were a trace on the right and 10 mg. on the left.

of crystalloids in the urinary passageway. In any individual patient either or both groups of factors may be operating at the same time or at different times.

Damage to the kidney substance predisposing to the precipitation of crystalloids is of importance in many cases. However, the exact factors that produce this type of damage with the associated precipitation of calcium salts are not known. Randall [10] has demonstrated subepithelial plaques of precipitated calcium which formed a nucleus for stone formation. Hellstrom, Huggins [11] and others [12] have demonstrated similar lesions and precipitations within and about the tubules and so-called microliths in kidneys associated with renal calculi. Precipitations of this sort appear experimentally and clinically in vitamin D "poisoning" and in hyperparathyroidism.[13] In both these conditions there is an increased urinary calcium excretion. This excessive excretion may be the underlying factor, or at least a very important factor, in the formation of these calcium deposits. Higgins [4] and others have established the fact that there is a definite relationship between vitamin A deficiency and stone formation. Vitamin A deficiency may act by destroying the vitality of the renal epithelium, thus permitting precipitation of calcium and phosphorus within it. Infection in the renal pelvis itself and obstruction to the outflow of urine from the pelvis may likewise damage the kidney substance. In this clinic twenty-one of a series of fifty-three kidneys in which renal stone was or had been present were found to have microscopic deposits of calcium within the tubules or the tubular epithelium, or microliths as

10. Randall, Alexander: Surg., Gynec. & Obst. **64**: 201 (Feb.) 1937.
11. Huggins, C. B.: Bone and Calculi in the Collecting Tubules of the Kidney, Arch Surg. **27**: 203-215 (July) 1933.
12. Crabtree, E. D.: Calcification Within Tubules of Kidney in Association with Urinary Tract Lithiasis, Tr. Am. A. Genito-Urin. Surgeons **23**: 17, 1930.
13. Albright, Fuller, and Bloomberg, Esther: Hyperparathyroidism and Renal Disease, J. Urol. **34**: 1-7 (July) 1935.

described by Randall, Hellstrom, Huggins and others. These lesions are strikingly similar to the lesions described in hyperparathyroidism, vitamin D "poisoning" and experimental stone production by hyperexcretion of crystalloids (Keyser [14]). Thus precipitations of crystalloids in the kidney substance of each individual patient may be produced by any one or any combination of the following factors: toxins, vitamin A deficiency, vitamin D poisoning, hyperparathyroidism, increased urinary calcium and phosphorus due to other causes, infection in the renal pelvis or urinary tract obstruction.

The two fundamental factors determining the precipitation or solution of calcium and phosphorus in the urinary passageways are the urinary p_H and the urinary concentration of calcium and phosphorus. Certain accessory factors may also be of importance: the colloids of the urine, the surface tension of the urine, the presence of stasis and the presence of bodies that might act as nuclei for the precipitation of crystalloids. The importance of the hydrogen ion concentration and the ease with which this concentration can be changed to the alkaline side by urea-splitting organisms, together with the marked frequency with which these organisms occur in patients with renal calculi, has been demonstrated by many workers. Experimentally the importance of the increased concentration of crystalloids in the urine has been emphasized by Keyser. The high incidence of urinary stone in hyperparathyroidism, in which increased urinary excretion of calcium and phosphorus occurs, has been emphasized by Albright and Barney. The high incidence of urinary calculi in patients with bone disease, in whom presumably there is some alteration in calcium metabolism probably associated with increased calcium excretion, has been emphasized by Holmes and Coplan and by Jones and Roberts and others. Steiner [15] has demonstrated that the epithelial desquamation which occurred in vitamin A deficiency may act as a nucleus for the precipitation of crystalloids. Again there is a multiplicity of factors one or more of which may be present in each patient.

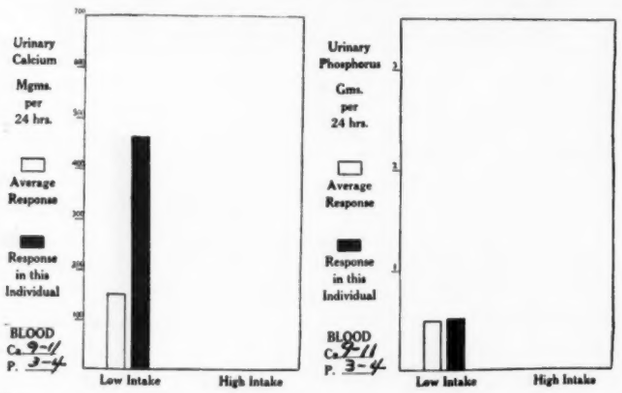

Fig. 10.—Urinary excretion of calcium and phosphorus by a patient with a fracture of the left femur of a week's duration. The patient is bedridden with the left lower extremity immobilized. Note the high urinary calcium response to the low intake.

There are, then, two groups of factors in the pathogenesis of renal stone: first, those factors which are associated with the precipitation of crystalloids in the kidney substance and, second, those which are associated with the precipitation of the crystalloids in the urinary passageway. Moreover, as discussed in the previous paragraphs, increased excretion of calcium and phosphorus in the urine may be of importance in both groups of factors.

The high incidence of increased urinary calcium in the thirty-five cases of calcium urolithiasis described in this report emphasizes the relationship between urinary calcium and the pathogenesis of renal calcium stones. Moreover, the fact that twenty-one of these patients showed no evidences of hyperthyroidism, hyperparathyroidism or bone disease emphasizes the fact that high urinary calcium may be present in these patients and must be considered in their prognosis and treatment even though conditions usually associated with increased urinary calcium are absent.

It would seem that, although the high concentration of the calcium in the urine of itself is not enough to bring about precipitation in the kidney substance or in the urinary passageway, it would predispose these patients to this occurrence. Therefore, given a patient or an otherwise normal person with a high urinary calcium, other factors being equal, he would be more likely to form stone than one with a low urinary calcium. For example, given two persons with infection of the urinary tract presenting urea-splitting organisms, the question as to the one who will form stone may depend on the urinary concentration of calcium. Similarly in deciding which patient will have a recurrence of stone following operative removal of urinary calculus, other factors being equal, urinary concentration of calcium will be the deciding factor.

Moreover, because of this relationship between urinary calcium excretion and urolithiasis, conditions that are associated with increased urinary calcium need complete quantitative study from this angle. When does the increased urinary calcium occur? How can it be modified? (fig. 10). In this way information may be obtained which will be of importance in the prevention of the occurrence and recurrence of calcium stone in the urinary tract.

The urinary calcium is of importance not only from an etiologic point of view but also from a prognostic and therapeutic point of view. The results of these studies emphasize the necessity of studying quantitatively the calcium excretion in the urine under different types of therapy instituted. They show that when increased urinary calcium is found the prognosis is poor and that acid ash diets and vitamin D should be used with care. Marked dilution of the urine should be sought for and all possible sources of this high urinary calcium searched for and eliminated. In contrast, in patients with low urinary calcium the prognosis is better and beneficial effects may be expected from acid ash diets. Moreover, in considering the problem of recurrence of stone in a particular kidney, the possibility of altered urinary excretion of calcium through that particular kidney is of importance.

SUMMARY AND CONCLUSIONS

1. A study was made of the urinary excretion of calcium and phosphorus under fixed conditions in a group of thirty-five patients with renal calculi. In twenty-three patients of this series high urinary calcium excretion was found. In three of the twelve with low urinary calciums there was a history suggesting increased urinary excretion of calcium at a time when the calculi probably started. Only two of these patients had clinical evidences of hyperparathyroidism.

2. All the patients with rapidly growing stones or new stone formation during observation were in the group presenting the high urinary excretion of calcium.

14. Keyser, L. D.: The Mechanism of the Formation of Urinary Calculi, Ann. Surg. **77**: 210 (Feb.) 1923.

15. Steiner, Morris; Zugar, Bernard, and Kramer, Benjamin: Production of Renal Calculi in Guinea Pigs by Feeding Them a Diet Deficient in Vitamin A, Arch. Path. **27**: 104 (Jan.) 1939.

3. The patients with high urinary calciums responded to an acid ash diet with an excessively increased urinary calcium as compared to the patients with low urinary calciums.

4. The patients with high urinary calcium responded to a moderate vitamin D intake with an excessively increased urinary excretion of calcium as compared to normal volunteers.

5. A study of the effect of pathologic changes in the kidney on the urinary excretion of calcium through that kidney was made in fourteen patients. A slight pathologic change was usually associated with definitely increased urinary calcium as compared with the normal mate; marked pathologic change was usually associated with definitely lowered urinary calcium as compared to the normal mate.

6. Increased fluid intake resulting in increased urinary output merely seemed to dilute the urine and thus reduce calcium concentration per unit volume. It did not alter significantly the total daily amount of calcium excreted.

7. Consequently, in the management of patients with urinary calculi it is important to consider not only such factors as vitamin A deficiency, infection of the urinary tract, hyperparathyroidism and stasis but also the quantitative urinary concentration of calcium and the quantitative influence on this concentration of any treatment instituted.

DO ALKALIS USED IN THE TREATMENT OF PEPTIC ULCER CAUSE KIDNEY STONES?

A STUDY OF 1,940 CASES

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The occurrence of urinary calculus in a patient who for a period of time has been taking alkalis in the treatment of peptic ulcer may arouse suspicion that the stone has formed as a result of the use of the alkalis. This idea appears to exist not only in the minds of the public but in the minds of some members of the medical profession as well.

The present study was undertaken with a view of securing data from which conclusions might be drawn as to the etiologic relationship, if any, between the use of alkalis in the treatment of peptic ulcer and kidney and ureteral stone formation.

The data that we present were obtained by an examination of the records of 2,210 cases, of which 1,260 cases were seen by one of us (H. L. K.) and 950 by the other (R. C. B.).

HISTORY

Calculous disease dates back to the very beginning of civilization. According to Joly,[1] the earliest specimen of a vesical stone was discovered by Prof. Elliott Smith in the grave of an Egyptian and was estimated to be about 7,000 years old. It was composed of a central nucleus of uric acid surrounded by a thick layer of calcium oxalate and ammonium-magnesium phosphate. He also described another stone which was found lying close to the second lumbar vertebra of a skeleton in a tomb, dating from the second dynasty about 4100 B. C. It was composed of carbonate, phosphate and oxalate of lime. From its appearance and the position in which it was found it was supposed to be a renal calculus.

The chemical composition of these stones bears a striking resemblance to the composition of kidney and ureteral stones that occur today, and one may say that through the past 7,000 years there has been no great change in the chemical composition of these calculi.

Randall [2] has recently published the results of the chemical examinations of a large series of kidney and ureteral stones. Attention may be called to the large number of kidney stones that were composed of pure calcium-magnesium phosphate, thirty-nine of seventy-one, or 54 per cent. We wish also to direct attention to the fact that of 100 cases of stone in the ureter in which the stones occurred in pure salts, forty-nine of them consisted of pure calcium-magnesium phosphate.

Before entering into a discussion of the question of the possible relationship between the use of alkalis in the treatment of peptic ulcer and the formation of kidney stones, it might be well to present briefly the various theories as to the origin of these stones. At the outset it might be well to call attention to the statement of Hinman, who says "No more is known of what starts the mechanisms of formation of stone than of the mechanism itself." Attention may also be called to the statement of Howard Kelley: "No stretch of chemical or physiological imagination will permit so heterogeneous a group of compounds to be ascribed to a common origin, or their deposition, in kidney, ureter or bladder, to be uniformly charged to an identical cause."

Since the treatment of peptic ulcer is intimately associated with a definite dietary regimen, it might be well to state at the outset that all patients are on a program designed to exclude the possibility of vitamin deficiency, so that avitaminosis as a factor can be excluded.

Experimental studies have been presented demonstrating a relation between deficiency of vitamin A and the production of urinary calculi in animals. Contributions on this subject have been furnished by McCarrison,[3] Fujimaki,[4] van Leersum, Perlman, Higgins,[5] Steiner, Zuger and Kramer [6] and many others. They agree that the vitamin A deficiency is often the cause of urinary calculi in experimental animals.

Furthermore, attention may be called to the fact that the incidence of urinary stone in children, especially bladder stone, has almost disappeared since the institution of modern diets which prevent avitaminosis.

During the past ten years a good deal of attention has been given to disturbance in the function of the parathyroids. Although renal calculi are found in hyperparathyroidism, it is doubtful whether it plays a role in the production of renal calculi as seen in practice.

Albright, Baird, Cope and Bloomberg [7] reported that 27 per cent of a series of eighty-three patients with hyperparathyroidism had renal calculi. On the other

From the Presbyterian Hospital and the A. D. Thomson Fund, Rush Medical College, University of Chicago.
Read before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

1. Joly, J. S.: Stone and Calculous Disease of the Urinary Organs, St. Louis, C. V. Mosby Company, 1929.

2. Randall, Alexander: Ann. Surg. **105:** 1009-1027 (June) 1937.
3. McCarrison, R.: Brit. M. J. **2:** 159 (July 30) 1927.
4. Fujimaki: League of Nations Health Organization, Geneva, 1926, p. 369.
5. Higgins, C. C.: Production and Solution of Urinary Calculi, J. A. M. A. **104:** 1296-1298 (April 13) 1935; J. Urol. **29:** 157 (Feb.) 1933.
6. Steiner, Morris; Zuger, Bernard, and Kramer, Benjamin: Production of Renal Calculi in Guinea Pigs by Feeding Them a Diet Deficient in Vitamin A, Arch. Path. **27:** 104 (Jan.) 1939.
7. Albright, Fuller; Baird, P. C.; Cope, Oliver, and Bloomberg, Esther, J. Am. M. Sc. **187:** 49 (Jan.) 1934.

hand, Braasch, Griffin and Osterburg in a study of 1,206 consecutive cases of urolithiasis found hyperparathyroidism as an etiologic factor in less than 0.2 per cent.

Albright and Bloomberg [8] concluded that formation of urinary calculus in hyperparathyroidism belongs to that etiologic group in which the predisposing abnormal factor is an excess of crystalloids in the urine.

Disturbance in the colloid-crystalloid balance as a cause of renal stone was proposed many years ago. It is based on the assumption that the urine is a supersaturated solution and that the crystalloids are held in solution because of the presence of protective colloids. Precipitation of crystalloids may occur if they are present in so excessive an amount that the normal colloid cannot hold them in solution or if they are present in normal amount and there is a diminished amount of colloids present.

Interesting in this connection is the fact that some patients have an excessive amount of crystalloids in the urine and yet stone never develops. As examples, cystinuria, oxaluria and phosphaturia may be mentioned.

The theory that interference with urinary drainage results in stasis and hence predisposes to stone is an old one. In cases of hydronephrosis with stone formation one is always confronted with the question of whether the stone made the hydronephrosis or vice versa. Although stasis may play a role in some cases, it can hardly be called on as a factor in the very large number of cases in which stasis is absent.

TABLE 1.—*Location of Stone in Seven Cases*

Case	Age	Sex	Location of Stone
1	43	♀	Kidney
2	40	♂	Ureter
3	40	♂	Kidney and ureter
4	47	♂	Ureter
5	45	♂	Kidney
6	47	♂	Ureter
7	48	♂	Kidney

There can be no doubt that infection plays an important role in a certain number of cases. On the other hand, the large number of cases of stone without infection immediately raises the question of the role played by infection in each case. Furthermore, the common cause of renal infection is the colon bacillus; the largest number of infections are not associated with stone.

The recent work of Randall is extremely interesting in this connection. According to him, renal calculous formation is dependent on a preexisting renal lesion, and this lesion consists of the deposition of calcium in the walls and intertubular spaces of the renal papillae. He believes that these calcium plaques appear to be a natural reparative process to some form of tubular damage. He was able with seven specimens to show a calculus attached to the calcium plaque.

THE RATIONALE OF ULCER TREATMENT

The use of alkaline substances in the treatment of peptic ulcer is more ancient than our knowledge of the lesion. Long before Baillie's description of the morbid anatomy and symptoms of gastric ulcer in 1793 and Cruveilhier's classic work some years later, sufferers with ulcer had learned that relief from the gnawing pains of ulcer could be had by taking chalk, magnesium and sodium bicarbonate. When the early standard types of treatment, such as Leube's and Lenhartz's, came into vogue, the employment of alkalis was a definite part of the regimen.

In 1914 Sippy proposed the use of acid neutralizing substances, chiefly alkalis and milk, to be taken with a frequency and in amounts sufficient to effect complete neutralization of the free hydrochloric acid in the gastric content from morning until night. The validity of the basic principle of the Sippy treatment, namely, freeing the exposed surface of the peptic ulcer from the tissue digesting action of the gastric juice by inhibiting its proteolytic action, as can be done by total neutralization of hydrochloric acid, has been well established in the intervening years.

As is true with most useful chemical therapeutic agents, alkalis must be used with a certain amount of discretion. Persons differ in their tolerance of various types of alkalis just as they differ in their tolerance of belladonna and other substances. In general, older persons tolerate them less well than the young and the middle aged. Many different alkaline substances have been employed, chiefly sodium bicarbonate, calcium carbonate, magnesium oxide and the tribasic phosphates of calcium and magnesium, and of these the latter three are apparently the least likely to cause an acid-base imbalance.

In the ulcer cases covered by this survey the group in the earlier years was treated with sodium bicarbonate and calcium carbonate. In the last ten years the tribasic phosphates of calcium and magnesium have been most commonly used in the treatment of ulcer at the Presbyterian Hospital. The amount required in the individual case is determined by aspiration of gastric contents and titration. The total daily amount of the tribasic phosphates used varies from 25 to 30 Gm. for periods varying from two to six months. If any symptoms indicative of disturbance of the acid-base ratio develop, the further use of alkaline salts is governed by estimation of the carbon dioxide of the blood plasma. Special attention is given to the vitamin requirements of these patients.

It has been claimed that the administration of alkalis in the treatment of peptic ulcer may cause certain disturbances in the calcium and inorganic phosphorus content in the blood serum. In order to determine whether or not there is any disturbance of the calcium phosphorus blood level, twenty-five cases of peptic ulcer under thorough alkalization were studied to determine the serum calcium and serum phosphorus content. The highest calcium figure was 12 mg. per hundred cubic centimeters, the lowest 9.3 mg. and the average 10.38 mg. The highest inorganic phosphorus content was 4.4 mg. per hundred cubic centimeters, the lowest 2.8 mg. and the average 3.65 mg. As the highest figures obtained are within the normal range and the averages are quite normal for both calcium and phosphorus, it would seem that the use of alkalis in ulcer treatment does not predispose to stone formation through elevation of blood serum calcium and phosphorus.

For the purpose of this investigation a detailed study of the records of 950 cases of peptic ulcer was made. These were taken from the files of the Presbyterian Hospital without selection but included a group of cases from each year from 1914 to 1937 inclusive.

A questionnaire was directed to this group of 950 patients, of whom 680 replied, and the data to be presented is based on the replies received from this group of 680 peptic ulcer patients who had had treatment for

8. Albright, Fuller, and Bloomberg, Esther: Tr. Am. A. Genito-Urin. Surgeons **27**: 195, 1934.

periods of from three to six months, the average period of accurate treatment being four months in duration. Many of these patients reported that they took minor amounts of alkaline powders over a much longer period.

INCIDENCE OF RENAL AND URETERAL CALCULI IN 680 CASES OF PEPTIC ULCER TREATED WITH MILK AND ALKALIS

An interesting fact that was brought out in this study is that twenty-one patients gave a history of urinary calculus before they presented themselves for diagnosis and treatment of peptic ulcer. By contrast, there were only thirty-three cases in which there was a history of urinary calculus that occurred sometime after the treatment of peptic ulcer was instituted.

In many of these cases symptoms of kidney stone developed from ten to twenty years after the treatment for ulcer had been discontinued. Furthermore, it must be borne in mind that a large proportion of this group of 680 ulcer cases had been treated from ten to twenty-five years prior to the period of this inquiry; hence in an evaluation of the data consideration must be given to the fact that in any such cross section of the population as represented by this group of 680 individuals—a majority of them now in middle or later life—a certain normal incidence of renal calculus is certain to exist.

Also in certain of these thirty-three cases of calculi occurring after ulcer treatment there may well have been an unrecognized, symptomless kidney stone at the time of institution of ulcer treatment, since the passing of stones within two months thereafter was reported in some cases. The spontaneous passage of a single small stone was reported in six of the thirty-three cases.

Summarizing the facts brought out by this study of 680 ulcer cases under treatment, there were twenty-one (3.1 per cent) in which stones occurred before ulcer treatment and thirty-three (4.9 per cent) in which stones occurred after ulcer treatment. Hence, even if the modifying factors previously mentioned (i. e., normal incidence of stone) are disregarded, it would seem that the case against alkalis as used in ulcer treatment as a cause of renal calculus narrows down to the difference between the 4.9 per cent of cases in which stone was reported after treatment and the 3.1 per cent of cases in which stones were reported before ulcer treatment, a difference of 1.8 per cent: not a grave indictment of the use of alkalis.

As an approach to this problem from the urologic point of view, the records of 1,260 cases were studied, supplemented by many personal interviews.

In this series of 1,260 cases of renal and ureteral calculi there were seven in which the diagnosis of stone and ulcer was made simultaneously and in which there had been no ulcer treatment. This group of cases is presented in table 1.

It is interesting to note that six of the seven cases occurred in men and that all seven cases occurred in the fourth decade.

Among the 1,260 cases were twenty-six in which there was a history of peptic ulcer, or 2.06 per cent. The age, sex, location of the stone and treatment carried out are given in table 2.

An analysis of this group shows that only fifteen patients, or 57.692 per cent, received alkalis for the treatment of ulcer. Seven of the remaining eleven patients, or 26.923 per cent, received surgical treatment. The operations performed were gastro-enterostomies and gastric resections. One of the patients had three operations for ulcer, namely a gastro-enterostomy, a gastrojejunostomy and finally a resection. The remaining four patients, or 15.384 per cent, received no alkalis in the treatment for peptic ulcer.

Since some of the patients were treated elsewhere for ulcer, the thoroughness with which the treatment was carried out as far as the amount of alkalis used is concerned may be open to question.

We wish to call attention to the fact that, of the fifteen cases in which alkalis were given, in three the stones occurred many years after the ulcer treatment was discontinued. In one instance the stone developed fourteen years later, in another ten years and in the third case five years later.

Because of the long period that elapsed between the cessation of ulcer treatment and the onset of the urinary calculi, one may question the relationship, if any, between the two and state that the occurrence of the stones so many years later was purely incidental.

TABLE 2.—*Location of Stone and Treatment in Twenty-Six Cases of Peptic Ulcer*

Case	Age	Sex	Location	Treatment
1	54	♀	Ureter	Alkalis
2	59	♂	Kidney	Gastro-enterostomy only
3	38	♂	Kidney (bilateral)	Alkalis
4	57	♂	Kidney	No treatment
5	59	♂	Kidney	Alkalis
6	41	♀	Kidney	Resection, stomach
7	62	♂	Kidney	No alkalis, milk and cream only
8	67	♂	Kidney	Gastro-enterostomy
9	53	♂	Kidney	Laparotomy for ulcer
10	57	♂	Kidney	No alkalis, milk only
11	55	♂	Kidney	Gastro-enterostomy + treatment
12	44	♀	Kidney	Alkalis
13	73	♂	Kidney	Alkalis
14	47	♂	Kidney	Alkalis
15	61	♂	Kidney	Alkalis
16	54	♂	Kidney	Gastro-enterostomy
17	38	♂	Kidney	Alkalis
18	70	♂	Ureter	Alkalis
19	52	♂	Ureter	Alkalis
20	45	♀	Ureter	Alkalis
21	41	♂	Ureter	Alkalis
22	68	♂	Ureter	Alkalis
23	35	♂	Ureter	Alkalis
24	27	♂	Ureter	Three operations for ulcer of stomach
25	39	♂	Ureter	Alkalis
26	68	♂	Kidney and ureter	No alkalization; soda once in a while

These stones were small and were passed by the patient or removed by cystoscopic manipulation.

It is interesting to note that some of the stones were pure uric acid, others were pure calcium oxalate and others were mixed.

Of this series of 1,260 cases of renal and ureteral calculi, a history of having taken alkalis in the treatment of peptic ulcer was obtained in only fifteen cases, or 1.2 per cent.

SUMMARY

1. In our present state of knowledge it is generally agreed that the specific cause of renal and ureteral stones is unknown, as is evidenced by the many theories that have been advanced.

2. The difference of 1.8 per cent in the incidence of stone formation between individuals who were given alkalis in the treatment of peptic ulcer and in those who were not is so insignificant as to make it improbable that alkalis used in the treatment of ulcer play a role in stone formation.

3. The incidence of 1.2 per cent of previous ulcer treatment in a series of 1,260 cases of kidney and

ureteral stone is small. Theoretically one might expect the alkalis used in the treatment of peptic ulcer to cause renal stones. The incidence of only 1.2 per cent of treated ulcer cases in a series of 1,260 renal and ureteral calculi, however, does not support this theory.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DR. HIGGINS, DR. FLOCKS AND DRS. KRETSCHMER AND BROWN

DR. JOHN MORRISSEY, New York: Urinary stasis and infection have a most important part in the formation of renal calculi. Vitamin A deficiency must be reckoned with as a factor in the general deficiency aspect of the disease. Calcium precipitation in and about the tubules is found both experimentally and clinically in vitamin D poisoning and hypothyroidism. It has also been established that the South African Negro of the Bantu type does not form renal calculi. Nephrostomy, prolonged pelvic drainage and uretostomy, all relatively new procedures, have introduced important new factors into the problem of the patient that outparallel the advance made along purely experimental lines. Continued insistence on the question of urinary stone solution, on methods of prevention and on recurrence and other associated items are very fertile culture mediums for the disturbed mind of the patient with stone. There is nothing more fallacious than the belief that any drug, either directly or indirectly through acidification of the urine, will dissolve a stone in the body. I do not mean to minimize the importance of the fundamental principles set forth by Dr. Higgins or the important observations of these thirty-five cases by Dr. Flocks with calcium stones. I do think, however, that continued insistence on the importance of dietary factors, chemotherapy and food deficiencies from vitamins A to Z all combine to place and retain the patient, whose ailment is 100 per cent a surgical urologic problem, in the hands of those practitioners who would temporize, whose clinical perspective is not surgical, and whose relative ability to handle properly the varied features of a problem of this type are inadequate. Thorough recognition and study of the fundamental principles set before us this morning will enable us of ourselves to evaluate for the patient more thoroughly, intelligently and completely his stone problem in the light of modern scientific urologic research.

DR. ROY J. HOLMES, Miami, Fla.: I feel that the overwhelming majority of recurrent renal calculi are, in reality, false recurrences. When one considers that the incidence of recurrence has been reduced from 50 to 10 per cent during the past twenty years, it seems improbable that such a marked reduction could be accounted for in any other manner than by improved x-ray and surgical management. By this I do not intend to minimize the importance of recent work on true recurrence which has been so well brought out by Dr. Higgins. Urologists have not progressed to the point in management of the kidney that has been operated on to account for such reduction on the basis of control over the etiologic factors. In my series I found that, if the renal pelvis was excluded, 80 per cent of all recurrent calculi were confined to the lower calix. Joly found the proportion six to one. This is of great importance, since it means that either the lower calix is by far the greater stone-bearing area or else it constitutes a stagnant pool well situated to catch and retain small calculi from other portions of the kidney. The predominant picture is that of a moderate sized stone blocking the neck of the lower calix with several sandlike particles in the minor calices. I am willing to admit that, even with the x-ray and various types of suction, I approach the problem of removing every vestige of sand from the lower calix with considerable fear and trembling. Dr. Higgins, in recognition of this point, has spoken favorably of heminephrectomy in selected cases in which there is dilatation of the calix. I not only agree with this point but might add that recently I have resorted to what might be termed a conservative resection of the lower calix. This work has not progressed far enough to justify more than casual mention. I feel, however, that if by partial encirclement of the lower calix with mattress sutures we can remove that comparatively small portion which has proved itself a habitual menace to the welfare of the entire kidney, we shall have gone far in correcting the problem of false recurrences. The study by Dr. Flocks of ureteral urine taken from each kidney at the same time is very interesting. It is apparent that a small stone in the kidney may, by partly obstructing the outflow of urine, establish a vicious circle in which the higher calcium concentration may serve to overwhelm further the protective colloids and lead to further agglutination of the crystalloids. The value of an intake of large quantities of water in cases of hypercalcemia has been emphasized. This is also the best treatment for combating urea-splitting organisms found in about 50 per cent of such urines.

DR. CHARLES C. HIGGINS, Cleveland: One presumption that has frequently been made in the literature and that has been referred to is the statement that when the patient has been on a diet containing adequate amounts of vitamin A there is no reason to believe that vitamin A deficiency is present. Such deductions are fraught with error and I believe that routine biophotometer tests should be made in every patient with renal lithiasis. Dr. Sargent has asked the question: What radiologic routine do you use to prove complete removal of all stones? I believe that as a matter of routine a roentgenogram of the exposed kidney should be secured at the time of the operation. This can be done very easily and I believe it is preferable to the use of the fluoroscope. The question has been asked as to whether or not a stone wave is occurring in the United States. In a review of the literature, I have found no evidence that calculous disease is increasing in frequency in this country. It has been noted by von Lichtenberg, Geza Illyes and others that following the World War there was a definite increase in calculous disease in certain parts of Europe. These men have stated that this was probably due to the fact that invading armies, not having adequate commissaries, were required to derive their food from the locality in which they were stationed; therefore the people in these communities were on a definitely deficient diet for extended periods of time. Obviously, other factors are associated with the formation of renal calculus. I have not seen the lesion of the papilla which Dr. Randall has described, although I have studied numerous kidneys which were removed because of calculous disease. Dr. Randall, however, has clearly shown the frequency of its occurrence. The question is asked as to whether this lesion is similar to that described by Dr. John Caulk in 1912. In 1912 Dr. Caulk described a lesion of the papilla on which there was a calcareous deposit which chemically was found to be composed of calcium phosphate, and later in 1926 Macgowan described a similar lesion.

DR. RALPH C. BROWN, Chicago: It is a satisfaction to an internist to discover that the urologists are about as much in the dark as to the etiology of kidney stone as internists are regarding the fundamental causes of peptic ulcer. There has been a fairly well defined idea that a marked increase in crystalloids in the urine predisposes to stone formation and internists who have occasion to treat many peptic ulcers have been subjected to a good deal of criticism from time to time because of the considerable amounts of alkaline substances used in ulcer treatment. As a matter of fact, we have never had precise information as to what happens with respect to calculus formation in individuals so treated. It was for the purpose of securing such information that Dr. Kretschmer and I undertook this study. On careful questioning of a large number of individuals who had been on ulcer management for from three or six months, some of them longer, it was interesting to find that the incidence of kidney stone after ulcer treatment with alkalis was only 1.8 per cent greater than it was before treatment. Even this small figure would probably vanish if one gave value to such a modifying factor as the normal probability of occurrence of stone in a large group of people who were replying to a questionnaire all the way from five to twenty years after they had been treated for gastric or duodenal ulcer. Furthermore, when Dr. Kretschmer finds that only 1.2 per cent of his very large series of patients with kidney stone gave a history of having been on peptic ulcer treatment at any time, one is forced to draw the conclusion that the use of alkalis in ulcer management has little or no influence in the causation of kidney

stones. It is interesting to bear in mind that there is being carried on a great public propaganda by magazine and radio advertising under the slogan "Keep Yourself On the Alkaline Side." If the use of alkalis really has much to do with this matter of stone formation, it would seem that during the next few years urologists should be called on to deal with a tremendous increase in the number of cases of renal calculus.

THE USE OF PLACENTAL BLOOD FOR TRANSFUSION

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For the past two years the medical profession has been extremely interested in blood banks. The casual reader would be led to believe that this work had been only recently developed. A carefully prepared bibliography, however, shows that the subject of blood banks was first described in 1918 by Oswald H. Robertson,[1] then of the United States Army. The experimental basis for his work was originated by Rous and Turner,[2] affiliated with the Rockefeller Institute for Medical Research. Dr. Robertson's[1] original article advocated the use of a preserving fluid consisting of 5.4 per cent dextrose combined with 3.8 per cent sodium citrate. In a personal communication dated October 1938, Dr. Robertson still favors this use of sugar and citrate as a preservative.

Rous and Turner[2] determined the viability of preserved blood cells by means of transfusion of these cells in bulk. Rabbits were used for this purpose. A normal rabbit was bled of a large quantity of blood, up to half its blood volume, causing a marked drop in the hemoglobin percentage and red cell count. Immediately afterward the rabbit was given a transfusion of an amount of preserved rabbit's blood equal to the amount lost in bleeding. The hemoglobin returned promptly to its previous level. The animal showed no ill effects from the procedure, and the hemoglobin and red blood cell count remained normal. This demonstrated that the transfused preserved blood cells were behaving as normal red corpuscles. By this means it was found that rabbit's blood could be kept living for two weeks. Many similar experiments were carried out with the same result.

Further study of the subject is illuminating, as in 1934 Lindenbaum and Stroikova[3] reported on the various preserving fluids as studied at the Institute for Blood Transfusions in Moscow. The solutions studied were citrate, a mixture of citrate and physiologic solution of sodium chloride, a solution known as "IPK" and, finally, a dextrose-citrate solution. The Moscow workers concluded that "IPK" solution, sometimes referred to as the Moscow solution, was only slightly more efficacious than citrate and that the dextrose citrate solution was superior. They reported that hemolysis took place in approximately ten days with the citrate solution, in twelve days with "IPK" and in thirty-five days with the dextrose and citrate solution. They considered the dextrose as a nourishing medium for erythrocytes while the other solutions represented only a culture of red blood corpuscles in their own plasma. Three objections were raised against the use of dextrose:

1. It represents a perfect medium for the growth of microorganisms.
2. Decomposition of dextrose in the preserving fluid leads to the formation of lactic acid.
3. Difficulties are encountered in sterilization.

This subject is not in its infancy; during the same year that the foregoing studies were made Balachovski and Guinsbourg[4] experimented on the use of preserved blood, using an equal amount of diluent similar to "IPK" and blood, and Ascoli and Vercesi[5] submitted from the gynecologic clinics of the University of Palermo, Italy, a comprehensive report on the use of placental blood in transfusions. The latter authors were of the opinion that placental blood was more efficacious than common blood and prophesied that cord blood would find a wide application in general hospitals.

In 1936 Novikova and Farberova[6] wrote a concise and instructive treatise on the use of placental blood from the Institute for Blood Transfusions in Leningrad. The technic described had been in use by these authors since 1933. They noted that placental blood averaged from 90 to 100 per cent hemoglobin and had from 5 to 6 million erythrocytes; that there was a relatively large amount of bilirubin and a low cholesterin and albumin fraction of the blood, while the amount of globulin was increased; that the potassium and calcium contents were relatively large and that the large amount of copper present should form a great advantage over adults' blood. The authors admitted the disadvantage of the small yield from one cord but stated that this could be overcome by the fractional use of two or more and warned that the blood from each cord should be transfused separately to prevent reaction.

During the same year Stavskaya[7] reported on the use of placental and retroplacental blood. He concluded that:

> Placental blood is indicated chiefly when not substitution but stimulation therapy is required, for example: (1) in anemias, because the placental blood contains a large amount of hemoglobin, erythrocytes and bilirubin; the bone marrow is stimulated and plastic material for regeneration of erythocytes furnished; (2) in hemorrhagic diathesis; in these cases placental blood is valuable because of its increased coagulability; (3) in shock.

Keller and Limpach[8] in 1938 reported on the use of placental blood from the Strasbourg Lying-in Hospital. Their observations were similar to those of other workers mentioned previously. However, they did mention the beneficial results of the use of the blood against ray sickness after ultrapenetrating roentgen therapy.

The pioneer work in the use of placental blood for transfusions on this continent was done by Drs. Goodall and Anderson of Montreal and their co-workers.[9] Dr.

From the Transfusion Service of the Massachusetts Memorial Hospitals.

1. Robertson, O. H.: Transfusion with Preserved Red Blood Cells, Brit. M. J. **1**: 691 (June 22) 1918; personal communication to the authors.
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Goodall not only brought to our attention the availability of placental blood for transfusions but also contributed a workable technic for the collection of the blood and its preservation. Dr. Goodall is an advocate of the "IPK" solution as proposed by the Moscow Institute of Hematology.

In March 1938 our hospital instituted a placental blood bank. The technic adopted was that set forth by Dr. Goodall.[9] Modifications of this technic have been made and laboratory studies carried out. We have attempted to answer the following questions: 1. Is the blood clean? 2. What is the best preservative? 3. What is the life of the blood? 4. Is the blood of use clinically and if so under what conditions?

Our attempt to modify Dr. Goodall's technic has been (1) to establish a more aseptic technic of collection, (2) to reduce the percentage of reactions and (3) to simplify the securing of a sample of blood for direct typing.

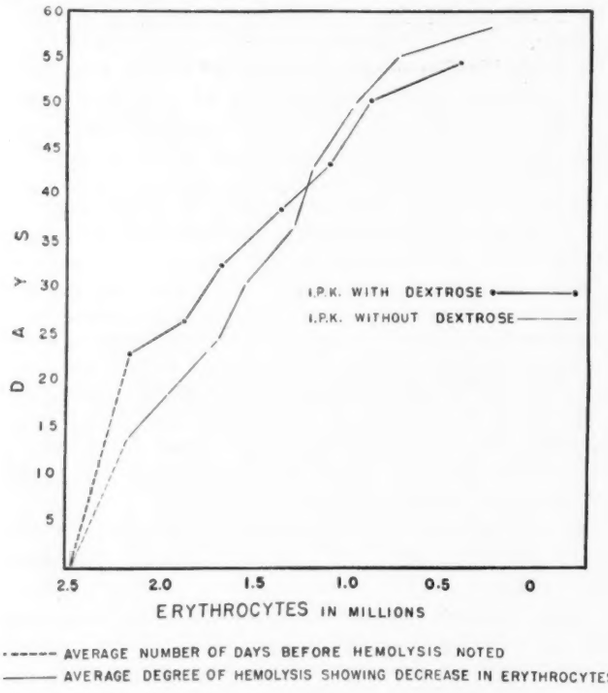

Fig. 1.—Average degree of hemolysis of ten placental blood banks with "IPK" and dextrose.

PROBLEMS

1. *Is the Blood Clean?*—With every collection of blood that is to be preserved for transfusion there has been an inoculation of sterile broth. The broth is incubated for from five to seven days. A culture is then transplanted on plates to determine what organism, if any, is present. The technic of securing the blood has improved to such an extent that at present it is only in a rare case that it needs to be discarded. We contemplate omitting the incubation of the plates and relying entirely on the examination of the broth, the flask corresponding to the culture that is turbid being discarded. Dr. Goodall[9] is of the opinion that any infection becomes so attenuated that it is innocuous after standing in the ice chest. Our technic, however, is extremely simple and we would rather be on the safe side.

2. *What Is the Best Preservative?*—When we began our study of placental blood we used the "IPK" solution advocated by Dr. Goodall.[9] Specimens were collected in flasks and sent to the laboratory. These flasks were unopened until hemolysis was observed. The average length of time before hemolysis set in was 14.4 days. Hemolysis was completed in these flasks in anywhere from forty-two to ninety-one days. Following the recommendations of Robertson[1] and of Lindenbaum and Stroikova,[3] we began using "IPK" and 5 per cent dextrose. In this series the hemolysis did not begin for 22.3 days. This change in preservative increased the availability of the blood by eight days. We recommend the use of this solution. Because of the technical difficulties of the ice chest, there was undue agitation of the flasks, which gave us our figure of 22.3 days. We are confident that a series of blood specimens now being studied will show an even more delayed hemolysis.

3. *The Life of the Blood.*—We have taken blood counts on the day of collection of a specimen submitted. A blood count is repeated on the same specimen on the day when hemolysis is first noticed. When we first began our study we counted the cells every day from the day of collection. We found that this is not practical, as the agitation caused by securing the blood resulted in early hemolysis. We have proved to ourselves that the decrease in cell count between these dates runs from 5,000 to 300,000, but as hemolysis increases the red cell count decreases. To interpret this finding in a practicable sense, flasks are usable until the twenty-second day when the "IPK" and the dextrose solution are used as preservative. At this time it is wise to discard them. However, in necessity these flasks may be used until hemolysis is well progressed; it must be realized of course that their efficacy has decreased in comparison to the amount of hemolysis. Since we discarded all flasks on the twenty-second day, no reactions have occurred during transfusion.

TABLE 1.—*Blood Count Just Previous to and Four Days Following Transfusion*

Condition	Red Blood Cells	Hemoglobin, per Cent
Anemia of the newborn	3,250,000-3,920,000	73-87
Malnutrition	3,100,000-4,100,000	72-80
Vomiting and diarrhea	3,700,000-4,300,000	56-63
Postoperative perineal prostatectomy	2,750,000-2,800,000	50-52
Carcinoma of the colon	3,450,000-3,760,000	60-66
Obstructing prostate	2,880,000-3,180,000	60-60
Obstructing prostate	3,000,000-3,580,000	50-59
Duodenal ulcer	3,120,000-3,300,000	65-65

Figure 1 shows diagrammatically the advantage of dextrose and "IPK" as a preservative over "IPK" alone. Not only does hemolysis take place eight days later but blood counts taken of the solution every four days following the onset of hemolysis reveals blood destruction carried on at a slower rate in blood preserved with the combined solution.

This chart represents an average of ten specimens of blood in which "IPK" was used alone as a preservative and ten in which "IPK" and dextrose were used. To interpret the curve, it is necessary to accept 5 million as the average cell count of placental blood. The blood is diluted one half, with preservative leaving 2,500,000 as an initial factor.

4. *Is the Blood of Use Clinically, and If So Under What Conditions?*—We have used the bloods in the following conditions. These are picked at random: malnutrition, secondary anemia, postpartum hemorrhage, cholecystogastrostomy, pyloric obstruction, carcinoma of the sigmoid, duodenal ulcer (gastrectomy), splenic anemia, carcinoma at the head of the pancreas

(jaundice), obstructing prostate, vomiting and diarrhea, erythroblastosis, papilloma of the bladder and carcinoma of the stomach.

We have made sixty-four transfusions, using seventy-eight flasks. This has been accomplished without a serious reaction and no fatalities.

While carrying out this study, we have compared the blood count just previous to transfusion to the blood count four days following transfusion, with the results given in table 1.

TABLE 2.—*The Number of Cases and Percentage of Incidence in Each Blood Type of the 120 Cases in Which Both Maternal and Placental Bloods Were Alike*

Total		O		A		B		AB	
Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
120	100.0	64	53.3	41	34.2	11	9.2	4	3.3

The interpretation of our results would lead us to agree with Stavskaya's [7] report that the blood is of more use in stimulation therapy than in substitution. We are studying the effect of placental blood on the reticulocyte count but our data at present are not sufficient to warrant a conclusion.

TECHNIC

1. *Establish a More Aseptic Technic of Collection.*—To prevent contamination, Dr. Goodall [9] suggested that a sterile towel with a hole in the center be applied

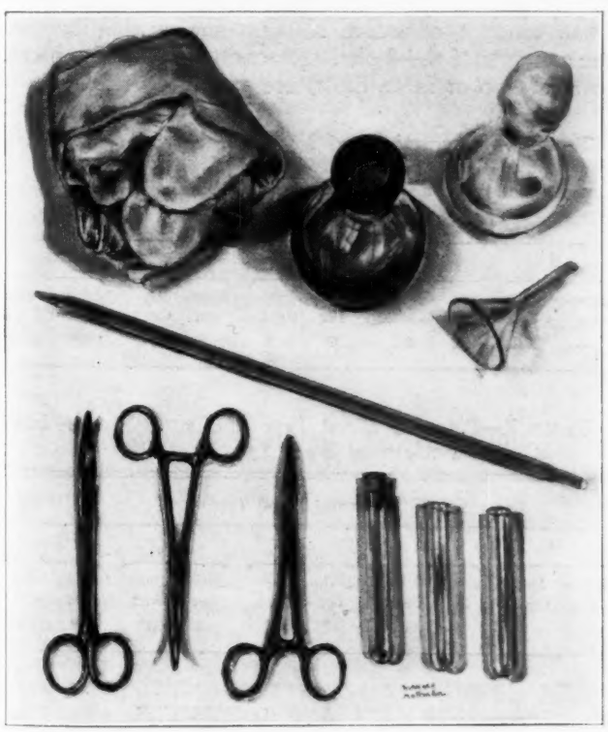

Fig. 2.—Table prepared for the collection of placental blood.

to the surgeon's gown. We have modified this technic by using large sterile cloth mittens that are slipped on over the surgeon's gloves and wrists, thereby preventing contamination when handling the cord.

2. *Reduce the Percentage of Reactions.*—Since 1934 all the intravenous solutions of dextrose and sodium chloride have been manufactured in our hospital under the supervision of the intravenous service.

Agreeing with Dr. Florence Seibert [10] that pyrogens are the cause of most of the reactions when intravenous fluids are used, and realizing that pyrogens multiply when exposed to the air, we have preserved our blood and its diluting fluid in air-tight flasks, using stazon

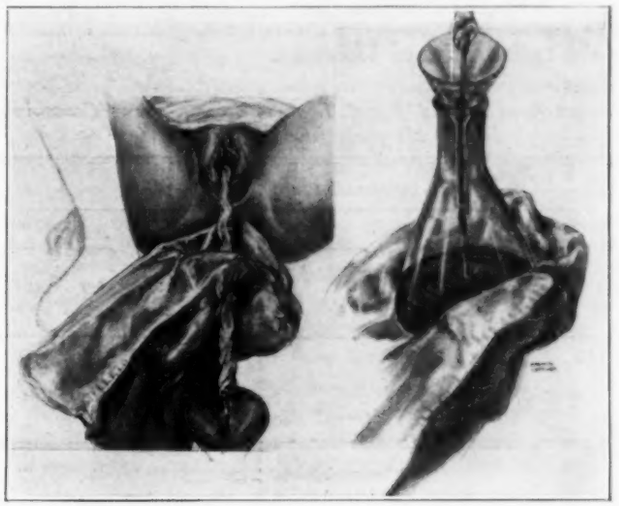

Fig. 3.—Use of the sterile mittens in collecting placental blood.

rubber stoppers instead of the familiar gauze stoppers. Reactions are also avoided if the blood is used for transfusion before hemolysis takes place. Our percentage of transfusion reactions is 4.6. This statement may be modified to the extent that since the establishment of the following technic no reactions have occurred: (1) fractional transfusions of more than one flask, (2) the use of blood before the twenty-second day and (3) the use of air-tight containers.

3. *Simplifying the Securing of a Sample of Blood for Direct Typing.*—Our experimental work and the work of others show conclusively that any disturbance of the blood while in storage hastens hemolysis. Knowing by the label that a certain flask is of a certain

TABLE 3.—*Placental Blood Types in Entire Series*

Maternal Blood Type	O		A		B		AB	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
O	64	35.8	25	14.0	4	2.2	..	....
A	13	7.3	41	22.9	2	1.1	2	1.1
B	6	3.4	2	1.1	11	6.1	3	1.7
AB	..	....	..	....	2	1.1	4	2.2

type is not sufficient reason to use that flask for transfusion. A direct typing must be done. If a flask is to be uncorked and a sample obtained with a pipet and found to be incompatible, this flask will hemolyze much sooner than an unopened flask. To make it unnecessary to disturb the blood, a pilot tube is attached to the outside of the flask. This tube contains a specimen of the blood and diluting fluid. Whenever transfusion is contemplated with this flask, a sample of the blood in the tube is removed for direct typing, and if it is found incompatible the blood has not been disturbed.

PLACENTAL AND MATERNAL BLOOD GROUPING

There were 179 cases in which the type of blood in both maternal and placental blood was determined. An analysis of these blood groupings revealed some very interesting data.

10. Seibert, Florence B.: Cause of Many Febrile Reactions Following Intravenous Injections, Am. J. Physiol. **71**: 621-651 (Feb.) 1925.

In 120 cases, or 67 per cent of the total series, the maternal and placental bloods were of the same type. These 120 cases were further subdivided with the results seen in table 2.

Table 3 shows the relative incidence and percentage of incidence of the various combinations of blood groupings found between the maternal and placental bloods in the entire series of 179 cases.

TABLE 4.—*Placental Blood Type of Ninety-Three Cases in Which Maternal Blood Type Was O*

Placental Blood Type									
O		A		B		AB		Total	
Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
64	68.8	25	26.9	4	4.3	..	....	93	100.0

TABLE 5.—*Placental Blood Type of Fifty-Eight Cases in Which the Maternal Blood Type Was A*

Placental Blood Type									
O		A		B		AB		Total	
Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
13	22.5	41	70.7	2	3.4	2	3.4	58	100.0

Tables 4, 5, 6 and 7 show the breakdown of the cases by maternal blood groupings.

DESCRIPTION OF TECHNIC

Into a 300 cc. Erlenmeyer flask is placed 12.5 cc. of 50 per cent dextrose solution. To this is added, by weight, 100 cc. of freshly distilled water and the contents of an ampule of citro-seroid[11] (25 cc.). The formula of citro-seroid is sodium citrate 5 Gm., sodium chloride 7 Gm., potassium chloride 0.2 Gm., magnesium sulfate 0.04 Gm. and distilled water 1,000 cc. In Lindenbaum and Stroikova's[3] original article this formula is referred to as "IPK." A stazon rubber stopper is loosely placed in the neck of the flask. The flask is wrapped and autoclaved. While the contents of the flask are cooling the stopper is inserted in the neck of the flask without the wrapping being removed. This allows the exterior of the flask to remain sterile.

The setup for the collection of the blood includes a flask containing the preservative, a pair of sterile mittens, a funnel, three small test tubes, a bottle of broth, a pipet, two Kelly clamps and a pair of scissors. Following delivery the cord is prepared with iodine, two clamps are applied and the cord is cut between the clamps. The gloved hands are now covered with a pair of sterile mittens. The cord is again sharply cut proximal to the clamp. The end of the cord is pointed downward and the blood collected in the flask through a funnel. The cord may be milked to add to the yield.

As the flow diminishes, blood is collected in two small test tubes, one for a Wassermann test and one for typing. The flask is slightly agitated and 10 cc. of the solution is obtained with a sterile pipet. One half of the content is used to inoculate the broth for a check on contamination; the other half is placed in the third tube and stoppered with a cork stopper. The stoppered test tube containing a mixture of the blood and solution is attached to the flask with elastic bands. The flask is sealed air tight with a stopper and is not to be reopened until it is to be used for transfusion. The stoppered tube containing the mixture of blood and preservative is known as the pilot tube.

A tag is attached to the flask. On this tag is recorded the name of the patient, the collection number and the date and a space for type, Wassermann reaction and culture report. The flask is then placed on the lower shelf of the refrigerator and kept at a temperature of 38 F. When the blood has been typed and the Wassermann reaction and culture reported negative, these data are placed on the tag and the flask is placed on the shelf above ready for use.

Placental blood may be collected on cesarean section. In these cases there is no chance of contamination. The only variation from the technic used in normal delivery is that the blood collected for the Wassermann test and typing is obtained after the placenta has been delivered.

When transfusion is contemplated, a flask of suitable type is chosen. A sample of the blood in the pilot tube is removed for direct typing. Usually two or three flasks are used for a single transfusion. These flasks are warmed in a bath and a continuous intravenous injection of physiologic solution of sodium chloride is started with an open Kelly bottle. A funnel is placed in the neck of the bottle with a gauze strainer and the contents of one flask are poured into the bottle.

The average yield of a flask is 100 cc. of blood. If a larger amount of blood is desired it may be added in a fractional manner, each flask added separately with a small amount of saline solution intervening between the contents of the flasks. Reactions may follow if contents of two or more flasks are added together.

TABLE 6.—*Placental Blood Type of Twenty-Two Cases in Which the Maternal Blood Type Was B*

Placental Blood Type									
O		A		B		AB		Total	
Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
6	27.3	2	9.1	11	50.0	3	13.6	22	100.0

TABLE 7.—*Placental Blood Type of Six Cases in Which the Maternal Blood Type Was AB*

Placental Blood Type									
O		A		B		AB		Total	
Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
..	....	..	....	2	33.3	4	66.7	6	100.0

SUMMARY AND CONCLUSION

From our experience with a placental blood bank which was inaugurated one year ago, we favor dextrose and "IPK" as a preservative. We believe that the percentage of reactions during a transfusion need not be higher than a whole blood transfusion (1) if the blood is used before hemolysis sets in, (2) if the blood is used in a fractional manner and (3) if the containers are kept air tight. We also believe that the blood is safe, economical and efficacious.

29 Bay State Road.

11. Ayerst, McKenna & Harrison.

ADMINISTRATIVE PROBLEMS IN CONNECTION WITH PSITTACOSIS

AND THE IMPORTATION OF AUSTRALIAN PARROTS

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A. B. CROWLEY; K. F. MEYER, PH.D.
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SAN FRANCISCO

On Jan. 24, 1939, a shipment of fifty-five Australian parrots arrived at the port of San Francisco on the S. S. *Monterey* of the Oceanic Steamship Company. The cargo had been en route from Queensland, Australia, and was intended for exhibition at the Australian Building during the Golden Gate International Exposition. The birds had been obtained from an aviary in Queensland and sixty-two were apparently healthy at the time they left the port of origin. En route seven, mostly King parrots, died. On arrival, the shipment passed through quarantine and was isolated on January 25 contrary to the usual custom at the Australian Pavilion on Treasure Island, which was declared a quarantine area by the United States Public Health Service. The collection of psittacine birds was inspected by the representatives of the United States Public Health Service and the State Department of Agriculture. According to a statement from the representative of the Department of Agriculture, the parrots were "in good health." Notwithstanding three days after arrival ten dead birds (two King parrots [Alisterus], three Crimson parrots [Platycercus], two cockatoos, one Blue-Cheeked parrot, one Yellow-Mantled parrot and one Blood-Stained cockatoo) were delivered to the George Williams Hooper Foundation; University of California, in accordance with an agreement between the foundation and the Surgeon General, United States Public Health Service, which requires the examination of all dead psittacine birds of importations held in quarantine in the ports of San Pedro and San Francisco. Gross examination of the cadavers revealed general emaciation, moderate to severe hemorrhagic enteritis, and small and pale spleens.

According to subsequent reports, the cages had been held outside the exposition buildings during a rainy night of January 25. The deaths of the nine parrots were attributed to exposure. One bird, found dead on arrival at the port of San Francisco, was included in the delivery made at the laboratory of the Hooper Foundation. Although the usual markings of psittacosis were absent, the organs were injected into mice. Within five days some of the mice died with lesions and microscopic appearances suggestive of psittacosis. Ultimately the virus was demonstrated in nine of the ten birds. On February 1 one dead King parrot and one Blood-Stained cockatoo in an advanced state of decomposition were submitted for examination; the King parrot was emaciated and the enlarged spleen contained the virus of psittacosis. The cause of death of the cockatoo was not determined. On February 13 these observations were reported to the representative of the United States Public Health Service and to the Director of Public Health of San Francisco, who had not been advised of the arrival of the shipment despite the fact that the sanitation of Treasure Island is entirely under his jurisdiction. Investigation conducted by the San Francisco health department on February 14 disclosed the fact that the parrots were still housed in the Australian Building and that the caretaker considered the quarantine to have expired on February 7 and 8. A check-up by the representative of the San Francisco Department of Public Health revealed that ten birds were missing. On inquiry it was found that the parrots had died, and since it was presumed that the quarantine had been lifted it was not deemed necessary to send the cadavers to any laboratory for examination. In fact, they were buried in the rear of the building. Apparently, the representative of the Australian exhibit had not been advised that the quarantine period invariably extends fifteen days from the date of the last death. Since the last bird had died on February 1 the quarantine would still have been in force on February 14 and the cause of death of the ten birds which succumbed between February 8 and February 14, in all probability to psittacosis, would have been definitely established. At the time the San Francisco health department made the inspection, thirty-one live and one dead King parrots were found. The director of public health of San Francisco requested the immediate removal of the thirty-one parrots to the Angel Island Quarantine Station.

The King parrot found dead on February 13 was examined the next day and presented the lesions of acute psittacosis with extensive necrosis in the liver. On direct examination the exudate covering the pericardium was teeming with elementary bodies. Epidemiologically, this observation amply confirmed previous observations that improper care and exposure activate the latent virus in carriers so frequently present among imported parrots, and acute infections may follow within two to three weeks among the cage mates. The systematic investigations of Burnet [1] on psittacosis in wild Australian parrots in 1935 fail to mention the King parrot (Alisterus or Aprosmictus scapularis). However, in a more recent report by Burnet [2] (1939), notable deaths among this species in the wild state in various sections of Australia attest its susceptibility. The experiences with the Australian shipment indicate that the King parrot may have escaped nest infection and thus proved highly susceptible as an adult. The majority of the psittacine birds which died en route belonged to this species. It is reasonable to suspect that they became infected by exposure to the carriers which were in the shipment.

On February 18 a Sulphur-Crested cockatoo was found dead with the gross lesions of pneumonia and enteritis; no virus was found.

A close clinical examination of the remaining thirty-one psittacine birds at Angel Island left the impression with a group of investigators who are familiar with bird diseases that, with the exception of a King parrot, a Blood-Stained cockatoo, a Crimson parrot and a quarrion, the shipment consisted of apparently healthy specimens. However, in the light of past experiences it was fully realized that a fair percentage of the parrots were carriers. Under the ideal conditions of housing in separate cages and uniform temperature there was little likelihood that further deaths would occur. In fact, between February 15 and March 1 the sick birds greatly improved and without a previous history

From the Department of Public Health, San Francisco (Geiger and Crowley) and the Hooper Foundation for Medical Research, University of California (Meyer and Eddie).

1. Burnet, F. M.: Psittacosis in Wild Australian Parrots, J. Hyg. **35**: 412 (Aug.) 1935.
2. Burnet, F. M.: Psittacosis in Wild Australian Parrots, M. J. Australia, to be published; Psittacosis in Australia, Sixth Pacific Congress, to be published.

of the shipment or laboratory observations the parrots would doubtless have been released. To permit the exhibit of survivors of a consignment of parrots in which deaths have occurred would, however, have meant courting disaster. Recent experiences in the London zoo amply attest such possibilities. In order to exhaust every means to decide the fate of the shipment and to test some newer diagnostic methods, it was decided to bleed the thirty-one parrots and to subject their blood serum to complement fixation tests with the psittacosis antigen. At the time of the bleeding on March 1 the sick King parrot and one quarrion were killed and the autopsy of both revealed residuals of a psittacosis infection with positive virus. The serum tests yielded a fairly large percentage of positive or suggestive reactions with the psittacosis antigen. The director of public health of San Francisco therefore refused the admission of the shipment to Treasure Island. On March 9 the remaining twenty-nine "healthy parrots" were bled to death and examined. One carrier was found among the corellas (Kakatoe sanguinea); one of the quarrions (Nymphicus hollandicus) and three of the Sulphur-Crested cockatoos (Kakatoe galerita) harbored the psittacosis virus in the enlarged spleens and livers.

COMMENT

The experiences collected in connection with the importation of Australian parrots for exhibition purposes to the American continent amply confirm similar observations previously reported by Levinthal [3] in 1935 in England and the studies of Burnet [1] on native birds collected in the forests of Queensland, Brisbane and Victoria. Since spontaneous psittacosis is widely distributed in the psittacine birds of the Australian archipelago, the risk of reintroducing this malady into aviaries of other countries is great. Ornithologists and inspectors should by this time appreciate the fundamental fact that a clinical examination is utterly useless in judging the state of health of a shipment of parrots. Laboratory examinations by properly qualified and experienced workers are paramount in deciding the admission of a consignment. Such examinations are particularly indicated when the past history of the shipment reports fatalities en route. Unfortunately this type of information is not always available since the shipment is not accompanied by a reliable caretaker. The shipping companies have paid little or no attention to these dangerous consignments. How many passengers have been exposed to the risk of psittacosis by these careless methods of transportation remains unknown. Fortunately, only two persons came in contact with the shipment under discussion. One of the men developed a severe "influenza"; unfortunately, he refused a complement fixation test and consequently the exact nature of his illness presents an unsolved and intriguing problem, since psittacosis is suspected.

From an administrative point of view the handling of the importations left a great deal to be desired. The parrots were not quarantined in an area specially reserved for purposes of this kind but were housed on an exhibition ground at a time when a great many working men could have readily been exposed to the contagion. There was no supervision by the authority entrusted with the maintenance of the quarantine. The collection and the transmission of the dead birds were left to the discretion of a caretaker. It is to his credit that he did the work well and carried out instructions implicitly. Doubtless he could have contracted psittacosis, and one wonders who would have assumed the responsibility for this illness, since this work was done under the instructions from the federal authorities; but his maintenance was paid by the consignee.

On numerous occasions, attention has been called to the inadequacy of the present quarantine regulations governing the importation of psittacine birds. A period of fourteen days is rarely sufficient to complete the mouse inoculation tests required to prove the presence or absence of the virus in the organs. Present and past experience has shown that acute psittacosis infections frequently develop during the quarantine period or shortly thereafter. Apparently healthy birds are released to the importer or dealer, who in turn promptly sells them to the public. Recently a Panama parrot was returned to a bird shop. Examination disclosed acute psittacosis and the significant fact that the bird had been released from quarantine two weeks before. The present regulations doubtless have protected the United States from widespread outbreaks of the character observed in 1929-1930. However, there is ample evidence to connect the South American and Mexican importations with human infections in California, New York and Oregon. Moreover, it is not unlikely that these shipments may have contributed to the maintenance of psittacosis in bird shops and aviaries of the United States.

In order to be effective, the period of quarantine should be extended to not less than three months, preferably six months. Finally, to derive the full measure of benefit from such a measure, the freedom of the importation from disease should be determined by laboratory tests. For larger parrots the blood serum complement fixation test done by an experienced laboratory may be valuable, since sufficient blood may be readily collected from one of the wing veins. One should, however, weigh judiciously the risk to which the person holding the parrots during the act of bleeding may be exposed. The three psittacosis infections in laboratory personnel reported from Germany by Haagen and Krückeberg [4] in connection with the organization of control measures amply attest the probable dangers. Since the large and expensive parrots are usually held separately, the cages may be covered with dampened cloths while putting the birds under anesthesia; thus the dispersion of the virus particles adherent to feathers into the air may be redued to a minimum. In any event, it is advisable to employ, if in any way practicable, those who have had psittacosis or whose serum tests would indicate resistance to the infection.

Shipments of parrotlets or smaller psittacine birds should be treated in a manner similar to those of parrakeets. A sample of from 10 to 20 per cent of the importations should be killed and examined post mortem, and the organs tested for virus by mouse inoculations. Occasionally the virus is weak and repeated passages extending over several weeks may be required to demonstrate it conclusively.

The various procedures just outlined will furnish reasonaby dependable information relative to the existence of psittacosis in a consignment. Parrots whose blood serum gives positive complement fixation reactions may or may not be carriers or shedders of the virus. However, there is no reasonable doubt that they have had contact with the psittacosis virus. Psittacine birds with enlarged spleens which are bacteriologically sterile

3. Levinthal, W.: Recent Observations on Psittacosis, Lancet **1**: 1207 (May 25) 1935.

4. Haagen, E., and Krückeberg, V.: Veröffentl. a. d. Geb. d. Volksgesundhdienst. **48**: 381, 1937.

on lifeless mediums but yield no virus on mouse passage tests must be considered very suggestive of psittacosis. The shipment may harbor a few carriers which may, under adverse environmental conditions, suffer from relapses and may become dangerous shedders. On the other hand, the absence of anatomic signs coupled with the absence of deaths among the parrots during the prolonged period of observations gives reasonable assurance that active psittacosis is in all probability not present in the importation. While in quarantine, cages with ricebirds (Padda oryzivora) should be suitably distributed throughout the rooms or building to test for the contamination of the air with virus which originates from the desiccated excreta of carriers or cases.

The procedures outlined will ultimately confront the health officer with important decisions. It may be necessary to rule that any consignment of parrots or parrakeets must be destroyed if active psittacosis infection is proved or even suspected. Any other procedure, in particular the release of survivors of a group in which deaths have occurred, is incompatible with sound public health practice. Doubtless, the health officer will be confronted with the accusation of ruthless slaughter. In case the shipments consist of parrakeets and parrotlets, he should remain adamant in his decision. On the other hand, as an alternative there may be permitted the periodic blood testing of the large and expensive parrots. Should the tests reveal no new infections over a period of six months, there may be safely transmitted the healthy birds selected from an infected shipment to the importer. The disadvantages of the latter procedure are largely economic, and until means have been found to defray the costs of the tests and those of an extended quarantine it is doubtful whether the bird dealers are prepared to risk importation of tropical birds. Thus the trade in psittacine birds and with it the danger of psittacosis would be enormously reduced. There remains, however, another source of trouble—importations to zoological gardens. It would doubtless be disastrous to prohibit or to curtail the exhibit of psittacine birds in these institutions, which are of great educational value. Fully cognizant of its paramount importance to society, the British Ministry of Health has exempted the consignments of birds of the parrot family for zoological gardens from the regulations which govern the importations to Great Britain. Recent experiences in London [5] have prompted the Zoological Society to impose a three months quarantine on all newly acquired parrots arriving at the zoological gardens. Precautionary measures have been adopted to protect the personnel supervising the birds while in quarantine and to dispose of the excreta in a sanitary manner. The wearing of rubber gloves, masks and goggles by the attendants looking after the birds is mandatory. Similar steps should be taken in the United States. In fact, if and when the directors of the zoological gardens agree to a three to six months quarantine in approved buildings and under expert supervision, the federal authorities and the local health officer may grant permission to admit psittacine birds to zoological gardens without previous isolation at the port of entry.

Only too often the health official has to meet arguments propounded by representatives of the bird trade that human infections due to exposure of imported psittacine birds are rare. In this connection it is important to emphasize that the course of the disease is by no means characteristic and is more readily camouflaged by the diagnosis of influenza. Moreover, individuals showing no clinical signs of illness may, none the less, be infected. With the aid of the complement fixation test, these silent infections may be detected. It is doubtless good public health practice to insist on a blood examination of persons who have been exposed to a consignment of diseased parrots.

Evidence produced in this report leaves no doubt that the trade in wild parrots and cockatoos introduces new problems in the control of psittacosis and makes it doubtless expedient to take protective measures.

5. Troup, A. G.: Adam, Robert, and Bedson, S. T.: Outbreak of Psittacosis in the London Zoological Gardens, Brit. M. J. **1**: 51 (Jan. 14) 1939.

PELLAGRA IN INFANCY AND CHILDHOOD

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During the past four years we have been studying the natural course of the development of pellagra in an area in which the disease is endemic. The habitual environment and dietary of more than 800 pellagrins in the Nutrition Clinic of the Hillman Hospital, Birmingham, Ala., have been studied. Since it seemed likely that each member of the household would be subjected to the same type of diet as the patient, we extended our studies to include the families of these pellagrins. Accordingly, the nutritional status of each member of the household was ascertained and we found that from one to six persons, including infants and children, showed evidence of pellagra. (It is interesting to note that blacktongue, a canine analogue of pellagra, was found in the dogs fed scraps of the food eaten by these families.) A diagnosis of pellagra was made in 194 children and in six infants, and in each case the diagnosis was confirmed by therapeutic tests. These studies are still in progress, but certain points concerning the manifestations of pellagra in infancy and early childhood have been clarified and form the basis of the present communication.

The children of pellagrous parents have been examined repeatedly, with particular attention directed toward the diet of the mother during pregnancy and lactation and of the child since birth, toward the physical and mental development of the child, and toward the presence or absence of lesions diagnostic of pellagra.

A careful history of the mother often revealed that her diet during pregnancy and lactation was inadequate and that, as a result, the quality of her breast milk was probably poor and the supply often insufficient for the child's needs. The nursing infants, therefore, had to be weaned soon after birth and were given some sort of food, which in many cases was inadequate for their nutritional needs. As they grew older, the majority of these children had poor appetites and usually ate very irregularly. Most of them preferred carbohydrate foods and often refused most of the other foods offered.

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The parents seldom attempted to change the food habits of the children, even if a good diet was made available. Analysis of the dietaries of such children shows that in most cases their diets were unbalanced and failed to supply in adequate amounts the foods essential for proper nutrition.

These children usually are underweight and underdeveloped for their age and appear to be undernourished and in ill health. Their parents state that they are irritable, easily frightened and "fretful" and that they cry a great deal. They are listless, tired and apprehensive and they do not manifest the normal interests of childhood. Those of school age find it difficult to concentrate and as a rule have made poor progress in school. Although the children seem too tired to play, they cannot rest. They do not sleep well at night but instead toss about and frequently awake crying. Many of them complain of soreness of the tongue and lips and of burning and pain in the stomach. Usually they suffer from constipation but they may have occasional attacks of diarrhea during the spring and summer months.

The response of infants and children to antipellagric therapy is as dramatic as it is in adults. The administration of nicotinic acid or yeast is followed by rapid improvement, and recent studies have shown that similar improvement follows the administration of monocarboxylic and dicarboxylic acids of pyrazine.[1] The preparation and use of these two chemical compounds have recently been described by one of us.[2] The total daily dosage of nicotinic acid and of the monocarboxylic and dicarboxylic acids of pyrazine is from 50 to 300 mg. We suggest 10 mg. tablets of nicotinic acid for children up to 6 years of age and 20 mg. tablets from 6 years of age up to puberty. They should be given not less than one hour apart. The monocarboxylic or dicarboxylic acid of pyrazine is dissolved in water and given in divided doses. One and a half ounces (45 Gm.) of brewers' yeast is recommended for children up to 6 years of age and 2 ounces (60 Gm.) for children from 6 years of age up to puberty. The daily dosage of yeast is mixed with milk and given in divided doses. The advantages of using crystalline chemical compounds are the ease of administration and rapidity of action. Yeast, although it is less easily administered, supplies several essential nutrients which these children lack.

Even in the absence of diagnostic lesions of pellagra the disease should be suspected in infants and children of families who have subsisted for long periods of time on an inadequate diet. Frequent examinations often reveal early signs of the disease. The administration of one of the therapeutic agents specific for pellagra in such cases offers a valuable therapeutic test, for these children will show prompt improvement following such therapy if early pellagra is present.

The representative history presented here illustrates the development of pellagra with typical diagnostic lesions early in childhood, and the response to diet and yeast therapy:

CASE 1.—R. J. A., an American white boy aged 3 years, was admitted to the pediatric ward of the Hillman Hospital with characteristic pellagra. The following history was obtained from his mother and father: He was allowed to eat whatever he chose and no attempt was made to have him eat anything he didn't like. His diet usually consisted of rice, honey, syrup, jelly, peanut butter, corn bread, biscuit crust, and occasionally oranges and prunes. Occasionally he drank a small amount of buttermilk but always refused sweet milk. During the spring of the previous year he had an attack of pellagra which was characterized by a symmetrical erythema over the hands, elbows, knees and around the neck. For the past six months he had occasional diarrhea and vomiting, resulting in a steady loss of weight.

Physical examination showed that the child was undernourished and poorly developed and was unable to walk. There was an area of erythema over the nose and malar surfaces of the cheeks, and large areas of pigmented, desquamating skin over the elbows, dorsum of the wrists, hands, and lower third of the forearms. A smaller area was present on the right side of his neck (collar of Casal).

The child was placed on a high caloric, high vitamin diet, supplemented with 15 Gm. of yeast in iced milk three times a day. Feedings had to be given frequently and in small amounts throughout the day and night. Although on admission he refused to take anything but fluids, he began taking semisolid foods such as scrambled eggs and applesauce on the fourth day in the hospital. His appetite improved remarkably and within ten days he was eating everything in a high caloric diet. The acute lesions over the face and dorsum of the hands healed first and the more chronic ones later. On discharge from the hospital, the pigmented skin on his face, hands and arms was clear and he appeared more alert mentally.

The following case history illustrates pellagra without characteristic lesions in an 11 months old infant. The relationship of the nutritional state of the mother to the child, the necessity for repeated examinations of children of pellagrous parents, the value of the therapeutic test in establishing a diagnosis of the disease and the response to nicotinic acid therapy are demonstrated clearly.

CASE 2.—J. McC., a white boy aged 11 months, was admitted to the pediatric service of the Hillman Hospital because of diarrhea. Various treatments were instituted, including extensive trials on scraped apple, pectin preparations, neoprontosil, paregoric, crystalline vitamin B_1, skimmed milk, acidophilus milk, evaporated milk and mashed banana. There was no improvement in the diarrhea during this period. The following history was given by the parents: The child's mother has always eaten an unbalanced diet, high in carbohydrate and low in protein, minerals and vitamins, despite the fact that a liberal and varied food supply was available until eight years ago. During the past eight years, however, the family income has been irregular and always inadequate for their food needs. The mother and the six other children showed diagnostic evidence of pellagra during 1939 and all were under treatment.

The diet of the mother preceding the birth of this child was inadequate both quantitatively and qualitatively. She seldom had more than one meal a day, which consisted of dried beans, potatoes and occasionally oatmeal with a small amount of evaporated milk. Following the birth of the child her diet remained unchanged, and although she had little milk she nursed him until he was 2 months old. For the first two months of the child's life he received an insufficient amount of breast milk which, because of the mother's deficient diet, was probably of poor quality. At the age of 2 months he had pneumonia. Because he was undernourished, the doctor advised weaning him and prescribed for him a mixture containing 4 ounces (120 cc.) of evaporated milk and the juice of one orange daily. When he was 6 months old the quantity of evaporated milk was increased to 14 ounces (420 cc.). In addition he was given one egg, one serving of green beans or turnip greens and three graham crackers daily. He usually took all the food prescribed, and his diet, since he was 6 months old, had been adequate except in its vitamin D content. He had intermittent diarrhea, however, and failed to gain weight. One week before admission, the diarrhea became severe and since this time he had refused most of his food.

Because of the failure of the child to respond to various accepted methods of therapy for diarrhea and in view of the family history, a diagnosis of pellagra was made even though

1. The yeast, nicotinic acid and monocarboxylic and dicarboxylic acids of pyrazine were furnished by Mead Johnson & Co.

2. Bills, Charles E.; McDonald, Francis G., and Spies, Tom D.: Antipellagric Action of Pyrazine-2,3-Dicarboxylic Acid and Pyrazine Monocarboxylic Acid, South. M. J. **32**: 793 (Aug.) 1939.

there were no characteristic lesions of the disease. One hundred and twenty-five mg. of nicotinic acid daily was added to his milk for two days. Within twenty-four hours the diarrhea disappeared and there was marked improvement in his general physical condition and appetite. Convalescence was rapid. The diagnosis of infantile pellagra, therefore, was confirmed by therapeutic test.

The following case history illustrates pellagra in early childhood and the response to treatment with monocarboxylic acid of pyrazine:

CASE 3.—B. H., a white boy aged 16 months, was admitted to the nutrition clinic of the Hillman Hospital with severe superficial stomatitis. The following history was given by the parents: The mother had always eaten an unbalanced diet, high in carbohydrates and fat, low in protein, minerals and vitamins. Until the child was 12 months old he received only breast milk. At this time, in addition to breast milk, which he continued to take until he was 14 months old, he began eating potatoes, dried beans, bread and occasionally an orange. He was allowed to eat as much of these foods as he wished and the amount he ate varied from time to time. He gained weight and seemed well until he was 14 months old, at which time he had "colitis" and for two weeks ate but little food, lost weight and became very weak. He was taken to a physician who advised weaning him. Since this time he had 1 pint of buttermilk daily, small amounts of oatmeal, potatoes and crackers, and occasionally an egg. His appetite was poor, he was not well, and he did not gain the 6 pounds (2.7 Kg.) he lost during his illness. Two weeks prior to admission he began refusing to eat and since this time he had only a small amount of oatmeal and buttermilk daily. The day he was admitted he became stuporous and was taken to a physician, who advised admitting him as an acute emergency case.

On admission the child was emaciated and apathetic. His tongue and buccal membranes were covered with superficial grayish ulcerations surrounded by fiery red erythema. No other physical abnormalities were noted. On two successive days the child was given 200 mg. of monocarboxylic acid of pyrazine, which was dissolved in sugar water. Twelve hours after administration the child willingly took food and his apathy disappeared. Many of the ulcerations had begun to heal and the erythema had vanished. One week later his mouth was entirely healed. He was alert mentally and was rapidly regaining his lost weight.

These studies suggest that infants and children who have subsisted on inadequate diets or whose parents have pellagra should be examined frequently for signs of the disease. The prognosis for a child is usually better than it is for an adult, but unless proper therapy is instituted the disease is likely to become increasingly severe as the person grows older until finally the skin, alimentary tract and nervous system become involved. Recovery is rapid and complete if a well balanced diet is given, supplemented, when necessary, with nicotinic acid, yeast or monocarboxylic or dicarboxylic acids of pyrazine.

SUMMARY AND CONCLUSIONS

1. The present study shows that, in an area in which pellagra is endemic, the disease is common among infants and children.

2. Nutritional histories often reveal that the mothers of these children subsisted on inadequate diets during pregnancy and lactation, thus establishing a definite relationship between the diet of the mother and the nutritional state of the infant.

3. Lesions characteristic of the disease are seldom seen in infancy but frequently appear early in childhood. In the absence of typical lesions, the administration of one of the therapeutic agents specific for pellagra offers a valuable therapeutic test in confirming a diagnosis of latent pellagra.

THE ELECTROCARDIOGRAPHIC CHANGES IN ACUTE PERICARDITIS

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Since it is usually a complication of a more easily recognized disease, acute pericarditis in the absence of an obvious pericardial friction rub or of a striking pulsus paradoxus is frequently overlooked. Despite the fact that a definite electrocardiographic pattern almost pathognomonic of acute pericarditis has been described, the value of this method of dignosis has not been generally recognized. In our limited experience, moreover, several electrocardiograms typical of acute pericarditis have been erroneously attributed to coronary occlusion.

In 1929 Scott, Feil and Katz [1] described transitory elevation of the RT segments in all three leads of the electrocardiogram in a case of hemopericardium and in one of purulent pericarditis. These changes were attributed to cardiac tamponade resulting from increased amounts of pericardial fluid and it was emphasized that this type of electrocardiogram could be differentiated from that of acute myocardial infarction. Since then electrocardiographic changes have been described by others [2] in cases of pericarditis, hemopericardium and stab wounds of the heart. In most of these reports the electrocardiographic changes were likewise thought to be caused by ischemia of the myocardium resulting from cardiac tamponade. Experimental work on animals, meanwhile, showed that definite and reversible changes in the RS-T segments and T waves could be produced by increasing the intrapericardial pressure.[3] No constant electrocardiographic pattern was observed in these various studies, but frequently the changes closely resembled those seen clinically.

In 1937 we [4] reported a study of fourteen cases of acute pericarditis in which serial electrocardiograms

From the Morris W. Stroud Jr. Fellowship in Cardiology, the Medical Services and the Ayer Clinical Laboratory of the Pennsylvania Hospital.

1. Scott, R. W.; Feil, H. S., and Katz, L. W.: The Electrocardiogram in Pericardial Effusion: I. Clinical, Am. Heart J. **5**: 68 (Oct.) 1929.

2. These include:
Purks, W. K.: The Occurrence of a Coronary T Wave in Purulent Pericarditis, South. M. J. **24**: 1032 (Dec.) 1931.
Elkin, D. C., and Phillips, H. S.: Stab Wounds of the Heart, Electrocardiographic Studies of Two Cases, J. Thoracic Surg. **1**: 113 (Dec.) 1931.
Porter, W. B., and Bigger, I. A.: Nonfatal Stab Wounds of the Ventricles, Am. J. M. Sc. **184**: 799 (Dec.) 1932.
Harvey, John, and Scott, J. W.: Changes in the Electrocardiogram in the Course of Pericardial Effusion with Paracentesis and Pericardiotomy, Am. Heart J. **7**: 532 (April) 1932.
Clowe, G. M.; Kellert, Ellis, and Gorham, L. W.: Rupture of the Right Auricle of the Heart, ibid. **9**: 324 (Feb.) 1934.
Koucky, J. D., and Milles, George: Stab Wounds of the Heart, Arch. Int. Med. **56**: 281 (Aug.) 1935.
Schwab, E. H., and Herrman, George: Alterations of the Electrocardiogram in Diseases of the Pericardium, ibid. **55**: 917 (June) 1935.
Wood, Paul: Electrocardiographic Changes of a T_2 Pattern in Pericardial Lesions and Stab Wounds of the Heart, Lancet **2**: 796 (Oct. 2) 1937.

3. These works include:
Katz, L. N.; Feil, H. S., and Scott, R. W.: The Electrocardiogram in Pericardial Effusion: II. Experimental, Am. Heart J. **5**: 77 (Oct.) 1929.
Foulger, Margaret, and Foulger, J. H.: The Blood Pressure and Electrocardiogram in Experimental Pericardial Effusion, ibid. **7**: 744 (Aug.) 1932.
Bay, E. B.; Gordon, Wayne, and Adams, Wright: Electrocardiographic and Blood Pressure Changes in Experimental Pericardial Effusion and Occlusion of the Venae Cavae, ibid. **8**: 525 (April) 1933.
Randles, F. S.; Gorham, L. W., and Dresbach, Melvin: Changes in the RS-T Component of the Electrocardiogram Produced by Experimental Rupture of the Auricles of the Dog's Heart and by Pericardial Injection, ibid. **9**: 333 (Feb.) 1934.
Herrmann, George, and Schwab, E. H.: Some Experimental and Clinical Electrocardiographic Observations on RS-T and T Changes in Pericarditis, Tr. A. Am. Physicians **49**: 229, 1934.

4. Vander Veer, J. B., and Norris, R. F.: The Electrocardiographic Changes in Acute Pericarditis, Am. Heart J. **14**: 31 (July) 1937.

were taken. In addition to the usual three leads a chest lead, with the apex of the heart and the left leg (lead 5 of Wolferth and Wood [5]), was employed as a routine. A characteristic electrocardiographic pattern was present in five of seven cases of purulent pericarditis and in one case of hemopericardium but in none of six cases of nonpurulent pericarditis. This pattern consisted of elevation of the RT segments in the three limb leads, most marked in lead 2, without the occurrence of significant Q waves. No definite changes were observed in the chest lead. These acute changes persisted for only a few days and in some cases returned to normal despite progression of the disease, with increasing amounts of pericardial fluid and signs of cardiac tamponade. Postmortem examinations were done in ten of the eleven fatal cases. Correlation of the observations

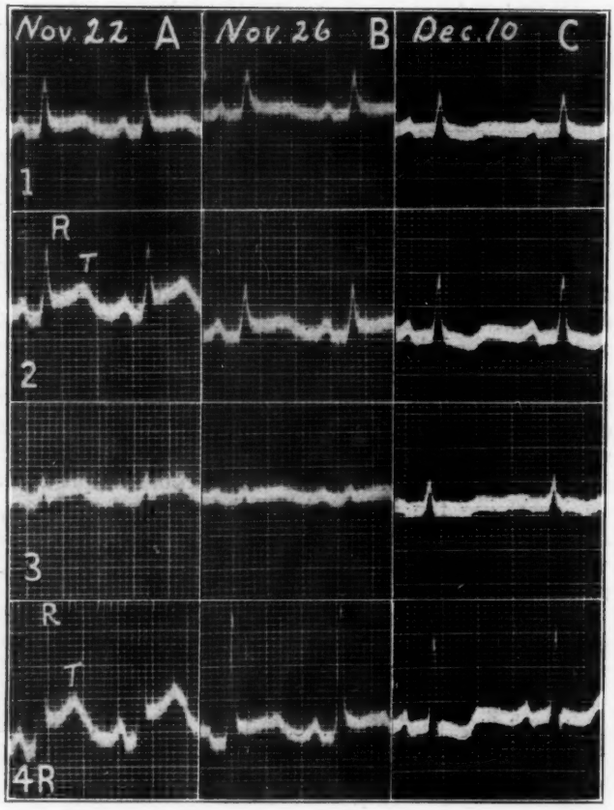

Fig. 1 (case 1).—*A*, record taken two days after a pleuropericardial friction rub was heard, shows an elevation of the RT segments in the three limb leads, greatest in lead 2, and a striking elevation of the RT segments in the precordial lead (apex and right arm). This is the typical pattern of acute pericarditis. *B*, record taken four days later, shows the changes still present though less marked. *C*, record taken a few hours before death, shows that RT segments have returned to the normal level and the T waves are diphasic in all leads. Some of this T wave change is probably "digitalis effect," as the patient was receiving full doses of this drug. Postmortem examination revealed 650 cc. of thick pus in the pericardial sac, empyema (both pneumococcus type II) and evidence of congestive heart failure.

made on clinical, electrocardiographic and postmortem examinations indicated that there was little or no relation between the amount of pericardial fluid and the electrocardiographic changes. The conclusion was reached that this typical electrocardiographic pattern was associated with superficial myocarditis secondary to inflammation of the epicardium.

Bellet and McMillan [6] subsequently reported a larger series of cases of acute pericarditis in which the three chest leads of Wolferth and Wood [5] were used in addition to the conventional limb leads. A similar electrocardiographic pattern was found in nearly 50 per cent of the cases of nontuberculous pericarditis and in two of twenty cases of tuberculous pericarditis. Deflections of the RT segments in the chest leads were at times more marked than in the limb leads. They also concluded that the changes of the RT segments were usually caused by subepicardial myocarditis.

Since our previous report* we have been using a different precordial lead in the study of cases of pericarditis. This lead is one of those which has recently been recommended for routine use by the American Heart Association and the Cardiac Society of Great Britain and Ireland.[7] By these organizations, lead 4 F (apex and left leg) was given slight preference to lead 4 R (apex and right arm) as a lead for ordinary use. Lead 4 F is the inverted mirror image of old lead 5 of Wolferth and Wood and, in both of these leads, deviations of the RT segments in acute pericarditis are usually minimal or absent.[8] In contrast to this, we have found that elevation of these segments in lead 4 R may be even greater than in the limb leads.[9] To illustrate this point and to reemphasize the importance of the electrocardiogram in the diagnosis of acute pericarditis, the following cases are reported:

REPORT OF CASES

CASE 1.—D. R., a Negro aged 55, admitted to the medical service of Dr. Garfield G. Duncan Nov. 16, 1937, for four days had symptoms typical of lobar pneumonia. On examination, signs of consolidation were elicited over the lower lobe of the left lung. The temperature remained elevated between 101 and 104 F. Pneumococcus type II was cultured from both the sputum and the blood. A pleuropericardial friction rub, heard near the apex of the heart November 20, disappeared a few days later. November 28, 45 cc. of cloudy fluid, thought to be removed from the pericardial sac, showed no growth on culture. The pericardial sac was not again tapped. November 30, 120 cc. of cloudy but sterile fluid was withdrawn from the left pleural cavity, but on subsequent occasions small amounts of purulent fluid aspirated from the left pleural cavity gave pure cultures of pneumococcus type II. Roentgenograms of the chest at first confirmed the clinical impression of lobar pneumonia in the lower lobe of the left lung and later of a small empyema of the left pleural cavity. The heart shadow was at all times enlarged, but no progressive increase in size was demonstrated. The patient continued to have a high fever and became increasingly dyspneic and cyanotic. The superficial veins of the neck were engorged and the liver became enlarged and tender. Slight peripheral edema was noted. Digitalization had little beneficial effect on the cardiac failure and he died December 11, twenty-five days after admission and twenty-nine days after the onset of the illness.

Of the laboratory data, the electrocardiograms were of especial interest. Repeated electrocardiograms, the first of which was taken November 22, two days after the friction rub was first heard, showed elevation of the RT segments in all leads. A gradual return of these changes to normal began November 26, and by December 10, the day before death, the only abnormalities were diphasic T waves in all leads, which may have been secondary to digitalization (fig. 1).

The anatomic diagnosis was: lobar pneumonia of the lower lobe of the left lung (pneumococcus type II); marked fibrinopurulent pericarditis and superficial myocarditis (pneumococcus type II); empyema of the left pleural cavity (pneumococcus type II); atelectasis of the lower lobe of the left lung; chronic passive congestion of the lungs, liver, spleen and pancreas; hypoplasia of the bone marrow.

5. Wolferth, C. C., and Wood, F. C.: The Electrocardiographic Diagnosis of Coronary Occlusion by the Use of Chest Leads, Am. J. M. Sc. **183:** 30 (Jan.) 1932.

6. Bellet, Samuel, and McMillan, T. M.: Electrocardiographic Patterns in Acute Pericarditis, Arch. Int. Med. **61:** 381 (March) 1938.

7. Joint Recommendations of the American Heart Association and the Cardiac Society of Great Britain and Ireland: Standardization of Precordial Leads, J. A. M. A. **110:** 396 (Jan. 29), 681 (Feb. 26) 1938; Am. Heart J. **15:** 107 (Jan.), 235 (Feb.) 1938.

8. Edwards, J. C., and Vander Veer, J. B.: A Study of the Chest Leads of the Electrocardiogram with an Evaluation of the Positions of the Precordial Electrode, Am. Heart J. **16:** 431 (Oct.) 1938.

9. The exact technic that we employed in taking this lead (4 R) has been recently described in a report by one of us.[8]

At necropsy 650 cc. of thick green pus was found in the pericardial sac and about 400 cc. in the left pleural cavity. Pure cultures of pneumococcus type II were obtained from both these exudates. The thick purulent epicardial exudate was already organizing and there was no cellular infiltration of the underlying muscle. The outer portion of the myocardium of both ventricles, however, was pale staining. Many of the fibers contained droplets of fat and the fibrils were broken. Most of the nuclei were vacuolated. Since the lower lobe of the left lung was evidently compressed by the pleural exudate, the alveolar walls were partially collapsed. Nowhere in sections of the lungs was there any evidence of bronchitis or pneumonia. Large patches of edema and "heart failure" cells, however, were present in the parenchyma. The splenic pulp and the central portions of the lobules of the liver were engorged with blood, and the acini of the pancreas were shrunken. The activity of the bone marrow of a rib and vertebral body was subnormal. The immediate cause of death was thought to be congestive heart failure.

The clinical diagnosis of acute pericarditis secondary to lobar pneumonia was confirmed by the electrocardiogram. The elevation of the RT segments persisted for only a week even though pus continued to be present in the pericardial sac. It is noteworthy that at necropsy most of the 650 cc. of pus in the pericardial cavity was posterior to the heart because of anterior intrapericardial adhesions. The return of the electrocardiogram to normal, the failure to demonstrate a progressive enlargement of the pericardium and the failure to aspirate purulent fluid from what was thought to be the pericardial sac influenced the clinicians against surgical drainage of the pericardium. The fever continued, however, and digitalization had no influence on the signs of heart failure. Since there was no residual pneumonia at necropsy, and the apparent cause of death was cardiac failure, surgical drainage of the pleural and pericardial cavities might have been life saving.

CASE 2.—M. L., a white woman aged 67, admitted to the medical service of Dr. David L. Farley July 17, 1938, had noticed weakness and shortness of breath for a number of months and had been acutely ill with fever and cough, productive of thick yellow sputum, for four or five days. The day before admission, persistent pain in the lower left part of the chest was first experienced. On examination the patient was senile and acutely ill. Herpetic lesions were seen about the lips. She was dyspneic and cyanotic but there was no peripheral edema. The contour of the chest suggested emphysema. Evidence of consolidation was found at the bases of both lungs. The area of cardiac dulness was slightly increased. Although the heart sounds were very faint and a marked pulsus paradoxus was present, a pericardial friction rub was not heard. On fluoroscopy no definite pulsation of the heart was seen and a roentgenogram showed patches of pneumonia in the lower lobes of both lungs. After several unsuccessful attempts to aspirate fluid from the pericardial sac, on July 23, 330 cc. of cloudy fluid was obtained at the apex of the heart in the fifth left intercostal space. Before the fluid was completely removed the pulsus paradoxus disappeared and the cyanosis and dyspnea were lessened. In a smear of this fluid, numerous gram-positive cocci were seen but no growth occurred on culture. Because of the return of cyanosis, dyspnea and pulsus paradoxus on August 1 and 2, 10 cc. and 250 cc. of cloudy fibrinous fluid respectively were removed from the pericardial sac. Air injected at the time of the last paracentesis was shown in a roentgenogram to be in the pericardial cavity. Cultures of both these specimens, however, showed the presence of Staphylococcus aureus.

During August further attempts at removing fluid from the pericardial sac were unsuccessful. August 3 and 26, 250 cc. of slightly cloudy but sterile fluid was aspirated from the left pleural cavity. At first the patient's temperature varied between 98 and 101 F., but during August the temperature slowly returned to normal. At the same time the signs of consolidation in the lungs gradually became less marked and the heart sounds became louder. A pericardial friction rub was never heard. In September, however, although pulsus paradoxus was only infrequently present, the patient became dyspneic and cyanotic. The liver was enlarged and tender, and edema of both legs appeared. Late in September the right leg became increasingly swollen, red and tender. Incision and drainage of the leg because of a suppurative cellulitis were necessary. Staphylococcus aureus was cultured from the pus. The patient recovered satisfactorily from this infection and the signs of congestive failure diminished with digitalization. Temporary auricular fibrillation was noted and partial heart block with occasional dropped ventricular beats was observed after the administration of digitalis. Because of senile dementia the patient was transferred to another hospital on October 26.

For much of her stay in the hospital there were a moderate leukocytosis and slight anemia. Small amounts of albumin were present in the urine. At first the blood urea nitrogen

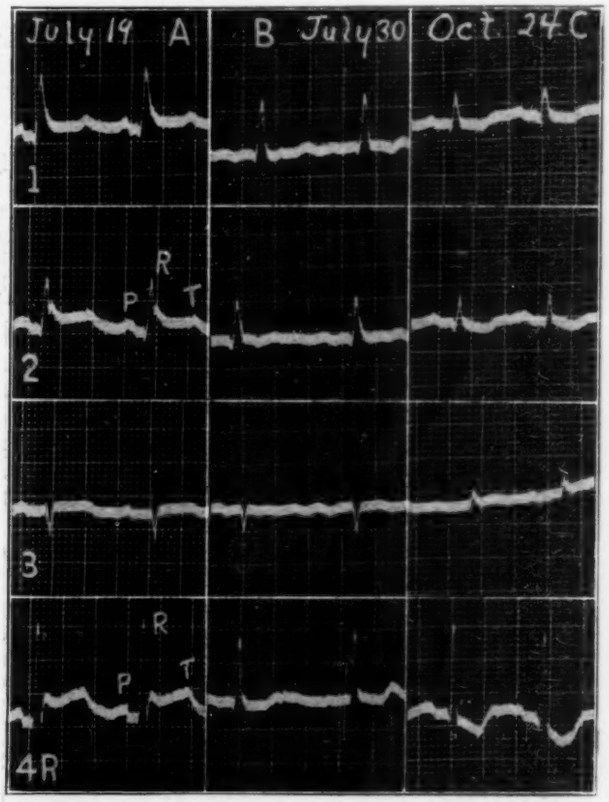

Fig. 2 (case 2).—Bronchopneumonia. *A*, a routine record taken two days after hospital admission, shows the characteristic pattern of acute pericarditis, which was not suspected clinically. Note the elevation of the RT segments in all leads. These changes persisted for nearly ten days and gradually subsided. Purulent fluid with Staphylococcus aureus was obtained on pericardial tap. *B* shows auricular fibrillation, which was transient, and return of the T waves to the normal level. *C*, record taken three months later, shows that there is a lowering of the amplitude of the QRS complexes in the limb leads and diphasic T waves. No evidence of pericarditis was present at this time, but digitalis was being given because of mild cardiac failure.

varied between 30 and 53 mg. per hundred cubic centimeters but in September a normal level was present. Other laboratory data were irrelevant. After admission repeated electrocardiograms showed marked elevation of the RT segments in leads 1, 2 and 4. These changes returned to normal July 30. During August the T waves of leads 1, 2 and 4 first became diphasic and then inverted, and a slight lengthening of the PR interval was noted. No further change of the RT segments had occurred when the patient left the hospital (fig. 2).

A routine electrocardiogram was responsible for the discovery of acute pericarditis in this patient, who was acutely ill with bronchopneumonia. Because of the patient's age and the apparent subsidence of a mild pericarditis following aspiration, operation was deemed inadvisable. It was felt that the typical electrocardio-

graphic pattern of pericarditis as well as the clinical condition excluded the possibility of coronary occlusion.

Case 3.—D. G., a white boy aged 13 years, admitted to the medical service of Dr. David L. Farley June 22, 1938, complained of anorexia and diarrhea. He was known to have had rheumatic heart disease since the age of 6 years and had attended the cardiac clinic of the Pennsylvania Hospital. For two weeks before admission he had fever, loss of appetite and slight diarrhea. On admission, the previous diagnosis of mitral stenosis and insufficiency and aortic insufficiency was confirmed. The systolic blood pressure was 120 and the diastolic 30 mm. of mercury. He appeared feverish and acutely ill. At first the patient's temperature was elevated daily as high as to 103 F. but the fever gradually subsided and he appeared improved. In the hospital he had no diarrhea. During August, however, he became worse and his temperature varied between 99 and 102 F. A pericardial friction rub was first suspected August 11 and by August 13 was marked to the left of the sternum, from the second to the fourth interspace. A pulsus paradoxus was not noted at any time and the venous pressure was not determined. He complained of precordial pain, became dyspneic and had a dry, nonproductive cough. The liver became larger but there was no peripheral edema. The patient was thought to have an acute exacerbation of rheumatic carditis and early congestive heart failure. In spite of the severity of the illness, his family signed his release from the hospital August 19.

Repeated blood counts showed moderate anemia and leukocytosis. The sedimentation rate at all times was much increased. Roentgenograms of the chest showed a progressive increase in the size of the heart, particularly to the left, but fluoroscopically

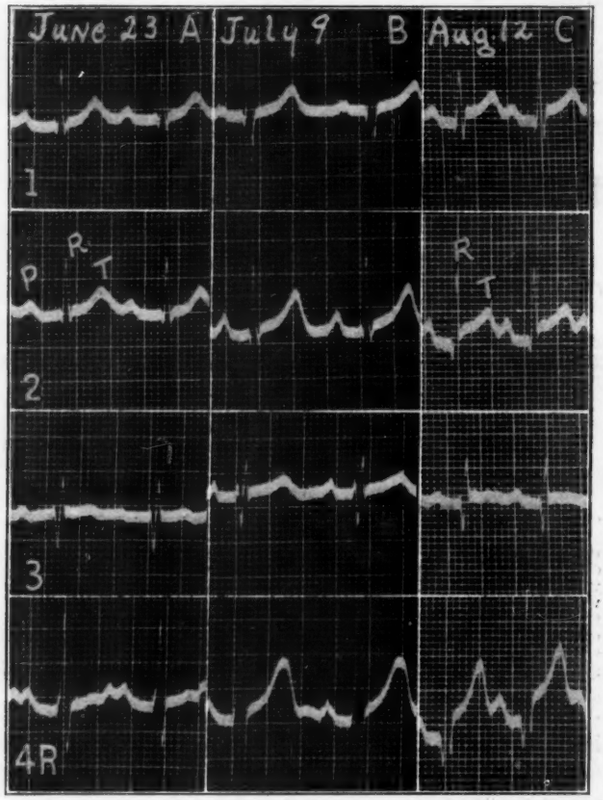

Fig. 3 (case 3).—Active rheumatic heart disease. *A*, record taken just after admission to the hospital, shows partial heart block (PR interval 0.24 second) but no other significant change. *B*, record taken sixteen days later and after considerable improvement, shows a conduction time just within normal limits. *C*, record taken one month later, when there was clinical evidence of active rheumatism with fever, dyspnea and precordial pain, shows the typical pattern of acute pericarditis. A loud pericardial friction rub was subsequently present for several days. No digitalis was being given. Note the elevation of the RT segments in all leads, greatest in leads 2 and 4.

cardiac pulsations were definitely visible. An electrocardiogram taken the day after admission showed a partial heart block (PR interval of 0.24 second) but by July 9 this abnormality had disappeared and the PR interval was 0.18 second. On August 12 elevation of the RT segments in all leads of the electrocardiogram was first noted and was thought to be typical of acute pericarditis (fig. 3).

The acute pericarditis in this case undoubtedly resulted from rheumatic fever. At the time of admission there was no evidence of pericarditis, although

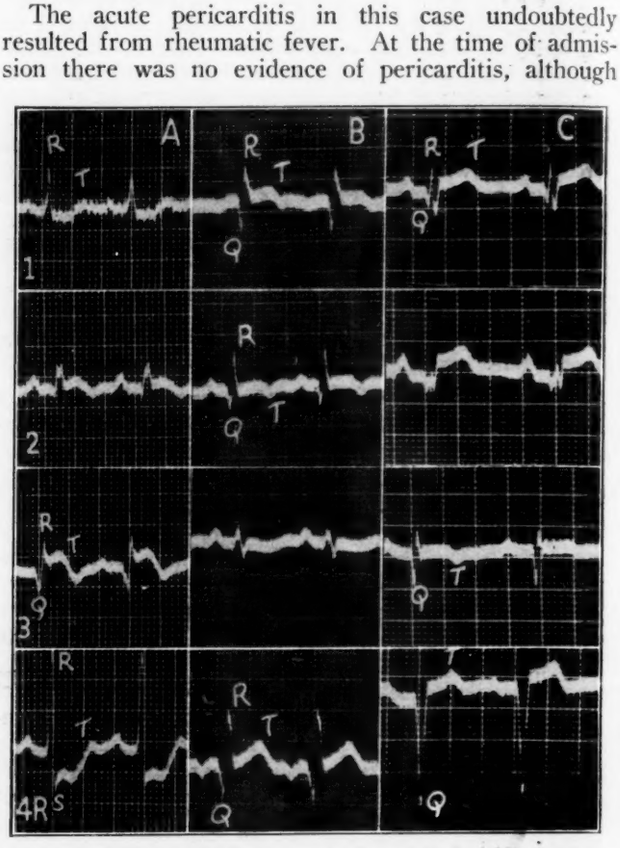

Fig. 4.—*A*, electrocardiogram of a patient with a recent posterior myocardial infarction. Note the elevation of the RT segments in leads 2 and 3, greatest in the latter, and the slight depression of the RS-T segments in lead 1. The precordial lead (4 R) shows a considerable depression of the RS-T segments. Note also the definite Q waves in lead 3, which became more prominent as the T waves rapidly became inverted in leads 2 and 3. The T waves in leads 1 and 4 returned quickly to normal. *B*, record of a patient with a recent anterior myocardial infarction. Definite elevation of the RT segments are present in leads 1 and 2 with beginning inversion of the T waves. Note also the definite Q waves in these leads and that the RT elevation is slightly higher in the first lead. Slight depression of the RT segments is seen in lead 3. Lead 4 shows a relatively deep Q wave and some RT elevation. The presence of definite Q waves in leads 1 and 4, with a slight reciprocal action of the RT segments in leads 1 and 3, makes the diagnosis of myocardial infarction quite definite. *C*, electrocardiogram of a patient with a combined anterior and posterior infarction. Elevation of the RT segments is seen in all the limb leads, greatest in lead 2. Q waves are present in all leads, however, and there are marked changes in the QRS complex of the chest lead with the loss of the initial positive deflection (R wave). There was subsequently a rapid change in the record with deep inversion of the T waves in leads 1 and 2 and an increase in the size of the Q waves in these leads. The deep Q waves persisted in the precordial lead and the T waves became sharply inverted. (The precordial lead taken originally in this case was the old lead 5. It has been reprinted by inverting and reversing the negative so that it conforms to the new terminology. This in no way alters the interpretation and makes it comparable to the other records.) Although the changes in the RT segments per se in this record conform to the pattern of acute pericarditis, the development of typical Q waves and the marked changes in the precordial lead easily differentiate it from this condition.

the electrocardiogram showed a temporary partial heart block (delayed PR interval). The electrocardiogram then returned to normal and, following an exacerbation of the infection, the typical clinical and electrocardiographic signs of acute pericarditis were observed.

COMMENT

A definite and characteristic electrocardiographic pattern is found in many cases of acute pericarditis. This typical pattern consists of elevation of the RT segments in the three limb leads and in the chest lead 4 R (apex of heart and right arm) which we have employed. In the case of the limb leads, elevation may be especially marked in lead 2 or in leads 1 and 2 together. The RT segments may also be more strik-

ingly elevated in the chest lead than in any of the limb leads. These changes may be caused by any type of pericarditis but most frequently by acute purulent pericarditis or hemopericardium. The abnormalities of the electrocardiogram are usually found early in the disease, are transient and may persist for only a few days. It is especially important to remember that the electrocardiogram may return almost to normal even though the infection and inflammation of the pericardial sac may be continuing and the pericardial effusion increasing. In contrast to acute pericarditis, most cases of chronic pericarditis show no definite electrocardiographic pattern, and abnormalities are usually limited to nonspecific changes in the T waves.

The most common lesion with which the electrocardiogram of acute pericarditis is confused is that of coronary occlusion. Since the clinical manifestations of precordial pain, fever, pericardial friction rub, leukocytosis and the like may be present in both diseases, the differentiation between them may at times depend largely on the interpretation of the electrocardiogram. In the case of myocardial infarction caused by coronary occlusion, the early transient abnormalities of the electrocardiogram are usually characterized by reciprocal deflections in leads 1 and 3. Thus in anterior infarction the elevated RT segments in lead 1 are usually associated with slight depression of these segments in lead 3, and in posterior infarction the elevation of the RT segments in lead 3 are also associated with depression of these segments in lead 1 (fig. 4 *A*). In the case of coronary occlusion, furthermore, definite Q waves are often present in leads 1 or 3 (fig. 4 *B*), but in acute pericarditis significant Q waves are generally absent in all leads except when they have been present before the onset of the pericarditis. Acute myocardial infarction involving both the anterior and the posterior wall of the left ventricle may give an elevation of the RT segment in all leads similar to that seen in acute pericarditis.[10] In these rare instances, however, the presence of Q waves in the limb leads and changes in the precordial lead establish the identity of the lesion (fig. 4 *C*). The recently described electrocardiographic pattern of acute lateral infarction, moveover, does not in any way resemble that of acute pericarditis.[11] Finally, if there is a return toward normal in the electrocardiographic pattern and particularly if the patient survives, it has been our experience that the subsequent tendency for the T waves to become inverted is much less marked in acute pericarditis than in coronary occlusion.

Until recently the abnormal deflections of the RT segments in cases of acute pericarditis and hemopericardium were explained largely on the basis of myocardial ischemia secondary to cardiac tamponade. Increased amounts of pericardial fluid were thought to increase the intrapericardial pressure to such an extent that coronary insufficiency resulted. To corroborate this view there were several experimental studies on animals in which an increase in intrapericardial pressure produced electrocardiographic changes, some of which closely resembled the pattern which had been described clinically.[3] These changes were reversible in most instances. Recent clinical studies, however, demonstrate that the typical pattern of acute pericarditis is frequently seen with no increase in the amount of pericardial fluid and that a marked pericardial effusion may accumulate slowly or rapidly without significant deflections of the RT segments. Postmortem examination in a number of cases has also indicated that the typical changes in the electrocardiogram are associated with and are probably caused by a subepicardial myocarditis. If the inflammation does not involve the myocardium, however, the pericarditis even though purulent may cause little or no change in the electrocardiogram.

Like any laboratory aid, the electrocardiogram is of greatest value when it gives positive evidence. Negative evidence must always be considered with caution. The electrocardiogram in acute pericarditis may return almost to normal within a few days, even though the changes have previously been striking and even though the patient has not improved. We wish to emphasize, however, that a definite electrocardiographic pattern typical of pericarditis has been described and that the importance of the electrocardiogram in the diagnosis of this disease has been established.

SUMMARY

1. The definite and characteristic electrocardiographic pattern seen in many cases of acute pericarditis was found in the three cases here presented.

2. The electrocardiographic pattern of acute pericarditis can be differentiated from that of acute myocardial infarction.

3. In cases of acute pericarditis, the changes in the electrocardiogram are generally caused by subepicardial myocarditis.

4. Lead 4 R (apex and right arm) is more valuable than lead 4 F (apex and left leg) in demonstrating the electrocardiographic changes in acute pericarditis.

5. The electrocardiogram is important in the diagnosis of acute pericarditis.

302 South Nineteenth Street.

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Clinical Notes, Suggestions and New Instruments

AN UNSUCCESSFUL METHOD OF BIRTH CONTROL

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The physician called on to advise his patients with regard to birth control is constantly on the lookout for some method just as effective as but simpler in technic than the commonly accepted methods of vaginal diaphragm or condom used with an intravaginal jelly.

One such product, marketed now for several years, consists of a jelly which is forcibly blown into the vaginal vault by a special applicator. The jelly itself does not have an unusual formula, consisting of a gum tragacanth base, boric acid, sodium chloride, oxyquinoline sulfate, lactic acid and glycerin. It does not melt at body temperature. This very effective type of applicator "splashes" the jelly into the vicinity of the cervix, and in the advertising material a contrast medium picture shows the external os well plugged by jelly.

The theoretical consideration of such a method nearly convinces one of its simplicity and effectiveness. The product appears even more attractive after one reads photostatic copies of letters from physicians who report using it successfully in their practice, one such report even coming from the head of the obstetric department in a university hospital. However, following is the record of twenty-three patients who used this method—patients in a small town practice where one's birth control failures do not become lost from sight but "come home to roost" on one's own confinement calendar. This series, while neither large nor observed over a long period of time, never-

theless permits certain definite conclusions. These patients were all of average or above average intelligence, all had had the method fully explained to them and, from careful questioning, all apparently followed directions closely.

Of twelve nulliparous patients, ten have thus far successfully used this method over an average time of 10.1 months, the shortest period of observation being six months and the longest eighteen months. In the nulliparous group there were two failures, one after two months and the other after three months. In the parous group were eleven patients. Successful were three, with an average time of observation of ten months. Pregnancies resulted in eight of the eleven. Two became pregnant one month after beginning this method, two more became pregnant in three months; the longest period of protection was eight months and the average for the group was only 4.1 months.

CONCLUSION

Twenty-three patients were studied who used as a birth control method a jelly forcibly sprayed into the vaginal vault with a special applicator. In the group of twelve nulliparous patients two became pregnant; of the eleven parous patients eight became pregnant.

This method of birth control is only fairly reliable for nulliparous women and is markedly unreliable after there has been a pregnancy.

HYPERSENSITIVITY TO SOLUTION OF POSTERIOR PITUITARY

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In 1936 I[1] reported a case of profound shock following the administration of solution of posterior pituitary. To this patient, following a spontaneous abortion, solution of posterior pituitary was given in 0.5 cc. doses at half hour intervals for four doses. Approximately a half hour after the last injection the patient was in shock. Later 1 cc. of solution of posterior pituitary was given, which almost immediately put her into a profound and frightening shock condition.

I am here reporting another case of hypersensitivity to solution of posterior pituitary. This is being done to add another case to the all too meager literature and to try to make the physician more cognizant of the bizarre and sometimes dangerous reactions that may follow the administration of a commonly used drug.

REPORT OF CASE

Mrs. F. F., a tertigravida aged 27, was admitted to the hospital May 14, 1939, with a history of having had vague abdominal and sacro-iliac pains at regular intervals for about twelve hours. Two weeks before she had entered the hospital and had remained there twenty-four hours for the same complaint. At that time she was discharged after the uncomfortable condition had been controlled with sedatives. After thirty-six hours of vague abdominal discomfort it was thought that the wiser procedure would be to induce labor. The patient was at term and also, as an added deciding factor, she lived 24 miles from the hospital.

At 6 a. m. 2 ounces (30 cc.) of castor oil was given. At 6:30 she had a bowel action and a hot, high soapsuds enema was given. As this was being expelled (6:40) 2 minims (0.13 cc.) of solution of posterior pituitary was given hypodermically. Ten minutes later the patient had urticarial wheals over the whole body. She was gasping for breath and was nauseated, the tongue, face and legs were swollen, there was marked pallor and she had the sensation of impending death. The blood pressure, which had been 140 systolic, 80 diastolic, was 76 systolic, 50 diastolic. Epinephrine was given immediately and most of the symptoms disappeared in a short time or were markedly lessened. Vaginal examination at 8 o'clock revealed a cervix effaced and one and one-half fingers dilated. The presenting part, the vertex, was dipping into the pelvis. At this time the membranes were ruptured artificially. She was delivered at 2:28 p. m. by elective low forceps of a normal boy baby weighing 8 3/16 pounds (3,686 Gm.). The placenta was expelled three minutes afterward. During labor morphine one-eighth grain (0.008 Gm.), scopolamine 1/100 grain (0.0006 Gm.) and pentobarbital sodium 7½ grains (0.5 Gm.) were given in divided doses. The labor was not abnormal—just what would be expected from one that had been induced.

The patient had had two previous deliveries, in 1936 and 1938. She had been nauseated for the entire duration of both of these pregnancies. The second one had been complicated by polyhydramnios. The first labor had been short, the second long. After both she had received 1 cc. of solution of posterior pituitary with no untoward results.

During this pregnancy, the third, she had had only the symptoms that a nervous multipara would have. There were no signs of toxemia. The Wassermann reaction was negative. She did have polyhydramnios, however. At no time were there any allergic signs or symptoms, and the past history was negative for any allergic manifestations.

On her third postpartum day, with her permission, 1 minim (0.06 cc.) of solution of posterior pituitary was injected hypodermically. Almost immediately she had the same reaction that she had had before. The urticaria was worse, particularly on the thighs and back, itching was more intolerable, and dyspnea was not quite as marked and the blood pressure did not drop as far. This may have been because we gave epinephrine as soon as we were sure that an anaphylactic reaction was starting. The hands, feet and face were more swollen than at the time of the previous reaction. Epinephrine was repeated three times, morphine one-sixth grain (0.01 Gm.) was given once. In spite of this, twelve hours later she was very uncomfortable. She complained bitterly of abdominal cramps; the uterus seemed to be in tetanic contraction most of the time. The next day her condition was normal, and three weeks later it was still normal.

COMMENT

Because of the constant and universal use of the drug, it seems strange that more cases of hypersensitivity to solution of posterior pituitary have not been reported. Hasson casually mentions that there have been cases previous to his reported one in 1930. De Lee in a personal communication says he has observed the phenomenon and Dieckman, quoted by De Lee, warns against the possibility. Twelve references were found in the literature, most of the cases being similar to the one reported here. Simon, and Pendleton and his associates subjected their patients to scratch tests with different brands of solution of posterior pituitary with positive results, but the exact mechanism of the phenomenon is not definitely known. Simon denies that there is excessive oxytocic action accompanying the reaction, while Pendleton insists that there is. It is interesting to note that in my case the first injection did not cause tumultuous uterine contractions. Three days afterward, however, when 1 minim was given, uterine cramps were very painful. My patient would not permit scratch tests to be made either on her or on her baby.

There have been several series of cases of postpartum shock reported in the recent literature, in some of which the etiologic factors have been unexplained. It would be interesting to know to how many of these patients solution of posterior pituitary had been given. Perhaps many more cases of shock occur from this cause than one suspects. For this reason I should hesitate before giving large doses and particularly repeated doses of solution of posterior pituitary. In cases of postpartum hemorrhage from atonic uteri, ergonovine preparations are probably safer and should be more efficacious. It is suggested that, when solution of posterior pituitary is given, epinephrine 1:1,000 be ready for instant use. If there is a reaction which cannot be controlled by epinephrine, magnesium sulfate might be tried intravenously.

Masonic Temple.

From the Obstetric Service, Danville Community Hospital.

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Special Clinical Article

TREATMENT OF PERITONITIS

CLINICAL LECTURE AT ST. LOUIS SESSION

THOMAS G. ORR, M.D.

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From the surgeon's point of view, peritonitis arising from perforations and leakage from intra-abdominal viscera is of chief interest. Since there is no specific therapy for peritonitis, treatment may be divided into procedures for the removal of the source of the infection and supportive measures to aid natural defenses. When the treatment is being planned, an estimate should be made of the pathologic condition, the altered physiologic function and changes in body chemistry, and the methods to be employed should be based on this estimate in each individual case.

Factors in the treatment of acute peritonitis worthy of special consideration may be outlined and discussed under the following headings:

1. Operation and abdominal drainage.
2. Decompression of the distended intestine.
3. Maintenance of the intestinal tone.
4. Use of peristaltic stimulants.
5. Maintenance of water and chemical balance.
6. Food supply.
7. Local application of heat.
8. Antitoxic serum therapy.
9. Chemotherapy.
10. Bed posture.
11. Oxygen therapy.
12. Blood transfusions.

OPERATION AND ABDOMINAL DRAINAGE

In the early stages of a perforated abdominal viscus it is logical to remove the source of the infection or close the leak by operation to prevent general peritoneal contamination. The results of early operation before abdominal distention and intestinal stasis have developed have been satisfactory. After the infection has become generalized and abdominal distention and inhibition of intestinal activity have occurred, operation is probably of little value unless there is a local accumulation of pus. Conservative treatment of general peritonitis, first advocated by Ochsner and now considerably elaborated, is fundamentally sound. Since peritonitis secondary to appendicitis has received the greatest attention, the value of the conservative method of treatment may be based on this type of infection. Unfortunately a unanimity of opinion does not exist among surgeons concerning the operative and nonoperative treatment of peritonitis due to appendicitis. However, if the issue is not clouded by the inclusion of local or early peritonitis and localized abscess, the weight of evidence is in favor of the nonoperative or conservative method of treatment. Mont Reid [1] warns that the total mortality of acute appendicitis may actually be increased unless the entire medical profession learns the clear indications for conservative therapy. It seems obvious that in a discussion of the treatment of general peritonitis only those cases presenting the clinical signs and symptoms of such infection should be segregated for nonoperative treatment. In cases in which there is abscess formation, resolution may result if judicious restraint is practiced by the surgeon.

The futility of attempting to drain the peritoneal surface is now generally recognized. As early as 1905 Yates [2] concluded that drainage of the general peritoneal cavity is physically and physiologically impossible. Any operative procedure designed to expose infected areas and place multiple drains in contact with the peritoneum can only do harm. There is a growing belief that complete closure of the abdomen in the presence of diffuse peritonitis is preferable to any type of drainage. Buchbinder and his associates [3] observed that abdominal drainage increased the mortality in experimental peritonitis. Clinical reports have also indicated a reduction of mortality in acute peritonitis when the abdomen is closed without drainage.[4] Since there is no universal agreement concerning drainage of peritoneal infections, definite recommendations applicable to all cases are difficult to make. When localized collections of pus or necrotic material are encountered at operation, drainage is indicated. Massive drainage is never indicated. Drains should not be placed on the assumption that purulent exudate will collect at a certain site and the presence of drains will prevent it. Any drain within the abdominal cavity is soon surrounded by adhesions and acts as a foreign body. The principle of placing drains so that contact with the peritoneal surface is minimal is good physiologic surgery. If drains are used for diffuse peritoneal infections they should be placed near, but not on, the original source of infection and should be removed early. When purulent exudates are found within the abdomen, adequate drainage of the abdominal wall is essential. Much suturing in the presence of infection adds foreign material and closes contaminated areas which predispose to the development of serious wound infection. In severe infections the peritoneum should be sutured and the remainder of the wound packed open or loosely closed with sutures passed through the full thickness of the abdominal wall down to the peritoneum.

Various procedures have been suggested for cleansing the abdominal cavity at operation. This type of treatment should be abandoned. Complete removal of all infection by washing or chemical sterilization of the peritoneum is quite impossible and contrary to known physiologic principles. Careful removal of excessive exudate by suction as part of the operation is in order, but extended efforts to cleanse the peritoneal surfaces disturb the natural protection against infection. As an infection progresses over the peritoneal surface a defensive exudate is elaborated which, when disturbed or removed, increases rather than decreases absorption. The experimental work of David and Sparks [5] has shown that a well developed plastic peritonitis almost completely prevents the passage of Bacillus coli from the peritoneal cavity into the lymphatic or blood streams. This was found true also of the diphtheria toxin. From the normal peritoneum or in the presence of a transudate, both Bacillus coli and diphtheria toxin passed freely into the blood and lymph streams.

From the University of Kansas Hospitals, Kansas City, Kan.

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A careful selection of cases for operation is necessary. The presence or absence of intestinal distention aids much in the decision. When there is no distention, operation is usually successful. When diffuse infection, abdominal distention, rapid pulse and dehydration are present, conservative nonoperative treatment is the choice.

DECOMPRESSION OF THE DISTENDED INTESTINE

Any rational treatment of intestinal distention must be considered from the standpoint of the effect of such distention on the organism. Is distention a part of nature's protective mechanism or is it evidence of an advanced pathologic condition? Certainly the degree of distention with reduction of peristaltic activity must be considered in estimating the condition of the patient. When auscultation of the abdomen reveals intestinal sounds, peristalsis is present in some degree. Audible peristalsis is a more hopeful sign than a completely silent abdomen. As distention develops, the blood supply of the bowel is reduced by intraluminal pressure. Excessive distention causes tissue destruction or gangrene. Absorption from the intestine is diminished as the intestine distends. Toxic products may be absorbed through the peritoneum when the blood supply to the intestinal wall is destroyed. Decompression of the intestine prevents necrosis of tissue from lack of blood supply, prevents peritoneal absorption and aids in maintaining the tone of the intestinal muscle. This treatment is then effective by preventing dangerous complications due to overdistention during the height of the infective process.

Continuous gastric and duodenal nasal suction as described by Wangensteen [6] is indicated in the treatment of intestinal distention resulting from peritonitis. The problem is not unlike that of intestinal obstruction. Constant suction through an indwelling nasal tube removes not only the liquid content of the bowel but the equally important gas and swallowed air that are always present. As signs of improvement in the patient's condition develop, the indwelling tube may be used for testing the return of function of the stomach and intestine. By clamping the tube for a period of two or three hours and measuring the intake and output of liquid, one can make an estimation of function. If the aspirated liquid is less than the intake, it may be assumed that peristalsis is again active and the tube may be removed. While the tube is in place the patient may be permitted to drink water and other liquids, which will pass freely through the tube. Drinking and chewing gum add much to the patient's comfort by satisfying thirst and keeping the mouth moist.

The Miller-Abbott [7] double lumen tube is useful in empyting the entire small intestine above an obstruction and is applicable to the treatment of intestinal distention due to peritonitis. After the technic of its use has been mastered, excellent results may be expected with this type of tube drainage.

The principal danger of continuous suction treatment of the stomach and upper part of the intestinal tract is the reduction of essential secretions, especially the chlorides. Ulceration in the stomach and esophagus and infection of the middle ear in babies have been mentioned as complications of the indwelling tube. The advantages of the tube far outweigh its disadvantages, and the latter are mentioned only as a safeguard.

The use of enterostomy as a means of decompressing the distended intestine complicating diffuse peritonitis is somewhat questionable. When decompression is most needed the intestine has usually lost its propulsive power and when such a condition exists only a short segment will be drained by enterostomy. After peristalsis has been restored, drainage of the intestinal content is not needed. When true organic obstruction or adhesive obstruction has developed with active peristalsis, enterostomy may be indicated. Organic occlusion requires surgical release, whereas acute inflammatory adhesions causing obstruction will usually subside after temporary drainage and permit restoration of intestinal function. High jejunostomy is no more efficient than suction drainage and is not indicated in the treatment of peritonitis.

Under the heading of intestinal decompression and drainage may also be considered the use of enemas. Liquids given in quantity by rectum, when the intestine is inactive, are frequently difficult to expel and may increase distention and discomfort. Animal experiments have shown that the solutions usually employed for enemas do not stimulate peristalsis in the small intestine and therefore would not aid in reducing its distention.[8] When the critical stage of the disease has passed and intestinal function has begun to be restored, small enemas may be given with benefit. The colon tube may be useful in any stage of the disease to aid in removing gas from the colon.

MAINTENANCE OF THE INTESTINAL TONE

To maintain the intestinal tone is to maintain the intestinal circulation. The decompression methods discussed obviously aid in maintaining and restoring intestinal tone. Morphine is known to stimulate rhythmic contractions of the intestinal muscle and raise the muscle tone as evidenced by increased intraluminal pressure.[9] Morphine may then be given with assurance in the treatment of peritonitis not only to increase the muscle tone but in sufficient quantity to make the patient comfortable, promote rest, relieve anxiety and minimize thirst. Overdosage signals are cyanosis and respirations below 15 per minute. When the patient begins to improve, morphine should be promptly diminished and when peristalsis has been restored it should be discontinued entirely. Since hypertonic sodium chloride solutions stimulate intestinal tone and peristalsis, it is reasonable to believe that by maintaining the blood chlorides at a normal level the tone of the intestinal musculature will be favorably influenced. To prevent overdistention of the bowel with its resulting disturbed circulation and at the same time to avoid disturbance of the efforts of the body to protect itself against infection is the principle of such treatment.

USE OF PERISTALTIC STIMULANTS

In view of the generally accepted opinion concerning the protective mechanism of diminished intestinal activity in peritoneal infections, the use of any stimulant which will produce active peristalsis during the acute stage of the disease may be considered harmful. Some clinical evidence has been presented which seems to negative this point of view. Potter [10] has used doses of 1 cc. of pitressin intramuscularly, beginning at the time of operation and given thereafter every

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8. Carlson, H. E., and Orr, T. G.: The Effect of Enemas on Intestinal Motility, Arch. Surg. **30:** 881 (May) 1935.

9. Orr, T. G.: The Action of Morphine on the Small Intestine and Its Clinical Application in the Treatment of Peritonitis and Intestinal Obstruction, Ann. Surg. **98:** 835 (Nov.) 1933.

10. Potter, P. C.: Acute Diffuse Peritonitis Following Acute Appendicitis with Report of Twenty-Five Cases, S. Clin. North America **14:** 379 (April) 1934.

two to four hours until intestinal tone has been regained. Brown [11] has expressed doubt about the protective mechanism of intestinal distention against infection and has recommended peristaltic stimulants at the first sign of toxic intestinal paralysis. Since the value of such stimulants is somewhat controversial, they should be used with discrimination. A fall in blood pressure with evidence of shock after the use of pitressin and prostigmine has been observed. When used, the dosage should be small at first and increased if reaction is not noted. The blood pressure is a valuable guide in controlling the patient's tolerance. Indiscriminate use of peristaltic stimulants in all cases of intestinal distention is bad therapy. Further and more scientific research in the clinical application of these preparations is very desirable.

MAINTENANCE OF WATER AND CHEMICAL BALANCE

Since vomiting and inability to assimilate liquids when given by mouth occur with peritonitis, dehydration and loss of essential secretions of the upper part of the gastrointestinal tract assume great importance. When vomiting is excessive, hypochloremia, disturbed acid-base balance and nitrogen retention may result. These changes can be determined by chemical analysis of the blood, which should be done in all cases of serious illness from peritonitis. After a few days of inability to take food, nutritional disturbances may ensue with lowering of the total blood protein, predisposing to general edema and edema of the lungs.[12]

The disturbance in water and chemical balance is best treated by parenteral administration of sodium chloride and dextrose solutions. Ringer's or Hartman's solution may be used, if preferred, instead of physiologic solution of sodium chloride. Sufficient sodium chloride should be given to maintain the chloride content of the blood at a normal level. The quantity of water and chloride necessary will vary with individual patients. Since the daily liquid intake of the average normal adult patient is from 2 to 3 liters, it is reasonable to assume that the sick patient will require at least similar quantities. Coller and Maddock [13] have quite accurately estimated that a sick patient showing definite signs of dehydration has lost liquid approximately equal to 6 per cent of his body weight. A patient weighing 60 Kg. would therefore require 3,600 cc. of water to combat existing dehydration. To this should be added in the first twenty-four hours of treatment 2,000 cc. to replace the insensible loss through the skin and lungs during that period, plus 1,500 cc. to make up the normal urine output. The total liquid requirement for the seriously dehydrated patient in the first twenty-four hours would equal the sum of 3,600 cc. plus 2,000 cc. plus 1,500 cc., or 7,100 cc. After the initial dehydration has been corrected, the daily necessary intake of liquid will usually not exceed 3,500 cc. When the water deficiency of any patient is estimated, the quantity lost by vomiting or suction, bleeding, drainage from fistulas, diarrhea and massive exudate must be determined and a like quantity restored to the body. As the patient improves and begins to retain liquid and food taken by mouth, the parenteral intake should be proportionately decreased.

As a practical plan for administering the estimated 3,500 cc. of water required in twenty-four hours, it is suggested that 2,000 cc. of solution be given by vein in the forenoon and 1,500 cc. by hypodermoclysis in the afternoon and evening. Patients who absorb solutions slowly when given by hypodermoclysis should receive the entire daily quantity by vein. The injection of solution should be discontinued before 11 p. m. so that rest during the night will not be disturbed.

Proctoclysis is a time-honored method of supplying liquid to ill patients and undoubtedly has definite merit in selected cases. However, when given to the patient sick with peritonitis it may increase existing distention and discomfort. It is also frequently difficult to estimate accurately the quantity absorbed by the body, since unknown quantities may be expelled about the intake tube or with bowel movements. Proctoclysis is therefore considered inferior to parenteral methods of administration of liquid, especially during the acute stage of peritonitis with abdominal distention.

It is possible to give a patient too much water and sodium chloride. Clark [14] has called attention to the danger of overburdening a weakened circulatory system by rapidly increasing the blood volume. General edema and edema of the lungs may result with excessive hydration when the solution given contains too much sodium chloride. At the first sign of edema the sodium chloride intake should be reduced or discontinued and the injected solution continued as a 5 per cent dextrose solution. Coller and his associates [15] have determined that for each hundred milligrams per hundred cubic centimeters which the plasma chlorides need to be raised to reach the normal the patient should be given 0.5 Gm. of sodium chloride per kilogram of body weight. If this rule is followed and frequent estimations of the blood chlorides are made, the danger of excessive chloride intake will be reduced to a minimum.

FOOD SUPPLY

To maintain metabolic balance during the destructive activity of disease would approach the ideal in therapy. Since this is not possible, especially in diseases of the gastrointestinal tract which prohibit the normal intake of food, parenteral feeding must be used as a poor substitute. At present dextrose is the food of choice which may be given safely intravenously or hypodermically. It is usually given by vein in a 5 or 10 per cent solution. A 5 per cent solution of dextrose is isotonic and may also be given by injection under the skin. Dextrose is particularly valuable in supplying liver glycogen and stimulating diuresis. Recognition of the importance of liver and kidney damage in many disease conditions has emphasized the therapeutic value of dextrose.

Very recently Mueller [16] has recommended the intravenous administration of a 5 or 10 per cent solution of alcohol in the treatment of peritonitis. The alcohol is added to the dextrose and saline solutions to furnish additional, much needed calories. He estimates that 2 liters of 5 per cent dextrose will supply about 400 calories, and if 100 cc. of alcohol is added nearly twice as many calories are available.

Solutions injected intravenously should be given slowly, usually at a rate not exceeding from 60 to 80 drops a minute. The rate of administration of hypodermoclysis must be governed by the rate of

11. Brown, H. P.: Peristalsis and Peritonitis, Ann. Surg. **100:** 167 (July) 1934.
12. Jones, C. M., and Eaton, F. B.: Postoperative Nutritional Edema, Arch. Surg. **27:** 159 (July) 1933.
13. Coller, F. A., and Maddock, W. G.: The Water Requirements of Surgical Patients, Ann. Surg. **98:** 952 (Nov.) 1933.
14. Clark, J. H.: Acute Cardiac Dilatation: Ever Present Danger in Intravenous Injections, J. A. M. A. **89:** 21 (July 2) 1927.
15. Coller, F. A.; Bartlett, R. M.; Bingham, D. L. C.; Maddock, W. G., and Pedersen, Svend: The Replacement of Sodium Chloride in Surgical Patients, Ann. Surg. **108:** 769 (Oct.) 1938.
16. Mueller, Sterling: The Use of Alcohol Intravenously with Special Reference to Its Value in Severe Peritonitis, S. Clin. North America **19:** 401 (April) 1939.

absorption. Excessive tumefaction of the tissues should be avoided. Discomfort may be minimized by adding 50 cc. of 0.5 per cent procaine hydrochloride solution to each liter of liquid to be injected.

LOCAL APPLICATION OF HEAT

Judging by clinical observations, the application of moist or dry heat to the abdomen is of value in the treatment of peritonitis. Experiments have shown that heat at a temperature usually applied clinically will penetrate the abdominal walls of children and thin adults.[17] Ochsner [18] believes that heat stimulates peristalsis. Patients are often made more comfortable by heat applied to the abdomen. Heat may also favorably influence the blood supply to the peritoneum. The dangers of heat therapy are almost nil if the skin is adequately protected against blistering.

ANTITOXIC SERUM THERAPY

Serums have been used with apparent benefit by some authors.[19] Because of the great variety of organisms which may infect the peritoneum from the gastrointestinal tract, the use of polyvalent serums, antitoxic to all pathogenic bacteria causing peritonitis, would be necessary to estimate the true value of such treatment. To date, the benefit derived from serum therapy has not been sufficiently convincing to warrant its routine use.

CHEMOTHERAPY

The value of specific drug therapy is yet to be determined. Sulfanilamide and the newer allied chemicals have not yet proved their worth in the treatment of peritonitis.

BED POSTURE

The semisitting and Fowler positions increase vital capacity and add to the patient's comfort. What effect such positions have on localizing infection in the lower part of the abdomen is difficult to determine. It is possible that gravity may be a factor in preventing the extension of the infection from the lower to the upper part of the abdomen, especially before distention and plastic exudates limit the spread of liquid infectious material.

OXYGEN THERAPY

A certain degree of anoxemia develops in patients with peritonitis as a result of reduced vital capacity, intestinal distention and toxemia. Oxygen should be given to such patients early in the treatment and not as a last resort after cyanosis has developed and dissolution is imminent. Fine and his associates [20] have made the important observation that the administration of high concentrations of oxygen promote the absorption of gas from the distended intestine. The importance of oxygen therapy has been emphasized by Thalhimer,[21] who has stressed the conclusions of Haldane that mild degrees of anoxemia have serious effects on the nervous system and that moderate or severe degrees may be fatal. Oxygen may be given by nasal tube. If the end of the tube is properly placed in the oropharynx, a flow of 6 liters of oxygen a minute will furnish a 50 to 60 per cent concentration to the patient.

17. Carlson, H. E., and Orr, T. G.: The Penetration of Moist Heat Applied to the Abdomen and Its Effect on Intestinal Movements, Arch. Surg. **30:** 1036 (June) 1935.

18. Ochsner, Alton: Postoperative Treatment Based on Physiologic Principles, South. Surgeon **4:** 197 (June) 1935.

19. Priestley, J. T.: Further Observations on Serum Therapy in Treatment of Peritonitis Secondary to Appendicitis, Proc. Staff Meet., Mayo Clin. **11:** 213 (April 1) 1936. Gundel, M., and Süssbrich, F.: Ergebnisse weiterer klinischer und mikrobiologischer Untersuchungen über die Peritonitis und ihre Serumprophylaxe und -therapie, Klin. Wchnschr. **13:** 1238 (Sept. 1) 1934.

20. Fine, Jacob; Sears, J. B., and Banks, B. M.: Effect of Oxygen Inhalation on Gaseous Distention of the Stomach and Small Intestine, Am. J. Digest. Dis. & Nutrition **2:** 361 (Aug.) 1935.

21. Thalhimer, William: When Is Oxygen Therapy Indicated and How Is It Best Given? Mod. Hosp. **38:** 105 (Feb.) 1932.

BLOOD TRANSFUSIONS

If the disease is prolonged or if anemia develops, transfusions are indicated. Inability to take protein foods by mouth soon causes nutritional disturbances resulting in a decrease in the total blood proteins which predisposes to edema. Transfusions cannot be given in sufficient quantity to restore the blood protein to normal but may be of definite value as a supporting measure.

COMMENT

Since treatment of acute peritonitis is still somewhat controversial in some of its aspects, positive or unqualified statements concerning methods of therapy would hardly be justifiable. Published mortality rates, which vary from 1.5 to 50 per cent, indicate that there has not been a uniform understanding of the pathology of peritonitis and its complicating disturbances of physiology and chemistry. The impression is gained by reading statistical reports that too much emphasis has been placed on total mortality rates and not enough on the segregation of similar pathologic processes with an accurate estimate of the death rate in each group.

Much of the treatment outlined here is unnecessary in mild types of peritonitis. In the fulminating types of infection any treatment may fail. Uniformity of opinion concerning the treatment of peritonitis cannot develop unless a uniformity of pathologic states is considered by every one studying the subject.

315 Alameda Road.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

AIRCO OXYGEN HUMIDIFIER ACCEPTABLE

Manufacturer: Air Reduction Sales Company, 181 Pacific Avenue, Jersey City, N. J.

The Airco Oxygen Humidifier is designed to humidify oxygen administered to patients by the oropharyngeal method. When the oxygen passes through the wash bottle, it contains sufficient water vapor not to dry the mucous membrane of the pharynx or larynx at the point where the catheter rests.

The unit consists of a cylindric bottle, roughly 6 by 15 cm., with tubes attached to a special inlet and outlet to lead from the oxygen tank to the patient. The inlet tube is incorporated in the cap and extends nearly down to the bottom of the cylinder. There are a number of perforations at the distal end of the tube to allow oxygen to bubble through. In addition to an outlet tube there is also incorporated in the cap a spring valve which serves to limit the amount of pressure which may be built up inside the glass cylinder. On the wall of the bottle are lines designating the upper and lower level to which the bottle should be filled with water.

Airco Oxygen Humidifier.

If the container is properly filled to the level indicated, there is no danger of blowing water over into the delivery tube. This holds true with oxygen flows of from 4 to 10 liters per minute. (One rarely, if ever, uses more than 8 to 10 liters per minute with a nasal or oropharyngeal catheter.) If the bottle is filled to the top level, the relative humidity of the oxygen delivered ranges from 35 to 50 per cent, with from 4 to 6 liters of oxygen flow per minute.

The humidifier was tested in a clinic acceptable to the Council and found to function adequately. The relative humidity

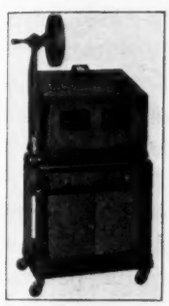
of the oxygen delivered is somewhat low, but no injurious clinical effects were observed. No pharyngitis was seen or other irritation attributable to insufficient humidity. The amount of humidity required for nasal or oropharyngeal administration of oxygen is an individual problem with each patient anyway. The unit was used interchangeably with another humidifier of known efficiency and no clinical difference was observed. The volume of water is rather small and must be replenished frequently.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Airco Oxygen Humidifier for inclusion in its list of accepted devices.

LIEBEL-FLARSHEIM IMPROVED SW2-C STANDARD MODEL SHORT WAVE GENERATOR ACCEPTABLE

Manufacturer: The Liebel-Flarsheim Company, 303 West Third Street, Cincinnati.

This unit is similar to the Liebel-Flarsheim SW2-C Model Short Wave Generator previously accepted by the Council (THE JOURNAL, Nov. 23, 1935, p. 1682) except that it has been improved to allow for an increase in power output. It is recommended for medical and minor surgical purposes. Applications may be made by inductance cable, treatment drum, cuffs, pads and orificial electrodes, and the unit may be employed to induce fever for hyperpyrexia treatments.



Liebel-Flarsheim Improved SW2-C Standard Model Short Wave Generator.

The unit is supplied in a portable wooden cabinet with separate subcabinet and in this form the net weight is about 76 pounds and the shipping weight is about 110 pounds. It is also supplied optionally in a one-piece all metal cabinet and in this form the net weight is 163 pounds and the shipping weight is 265 pounds.

Two oscillator tubes are utilized in a tuned plate, tuned grid, circuit generating a wavelength of about 22.6 meters. The patient, cable and drum circuits are inductively coupled to the oscillator. A filter is employed in the supply line for the purpose of minimizing line feed-back for possible radio interference. The circuit also incorporates a device which protects the oscillator tubes from overload and gives an audible signal when the unit needs readjustment. An electric fan provides forced-draft ventilation.

The firm submitted engineering data to support its claim for the power output of the machine. This is as follows:

Calorimetric Method.—The temperature rise induced in a given amount of water in a given time indicates an average output of 465 watts on the pad circuit and 470 watts on the cable circuit, with an input of 1,160 watts and 1,175 watts respectively.

Photoelectric Cell Method.—Two 300 watt bulbs were arranged in parallel. Measurement of light indicated an average on the cable circuit of 540 watts output with 1,185 watts input, and on the pad circuit 495 watts output with 1,180 watts input.

Tests were carried out for the Council to substantiate these claims. Three separate calorimetric tests were carried out with the apparatus, and the results showed that the claimed output of 470 watts at an input of 1,160 watts could be obtained readily.

The unit was operated at full load for two hours. The transformer temperature rise was found to be low enough to meet the requirements of the Council.

To provide evidence as to the functioning of the machine in heating the human body, the firm submitted a series of tests performed in a reliable clinic.

Treatments were given for twenty minutes each in accordance with the patient's tolerance. For the coil technic, four turns of the cable were wrapped around the thigh with approximately 1 inch spacing of turkish toweling. Two turns were taken high up on the thigh, then about 4 inches of spacing was allowed for inserting the thermocouples, and two more turns were taken below the incision. When the treatment drum was used it was applied over the thigh, as close to the skin and as nearly over the point where the temperatures were read as the thermocouples would permit. For the cuff technic, two cuff electrodes with approximately one half inch of felt spacer under each were wrapped around the thigh with about 4 inches spacing between the proximal edges.

A Chapman orificial electrode also was used. This electrode was drilled out so that a thermometer could be passed through

Average Temperatures of Six Observations

	Deep Muscle, Degrees F.		Oral, Degrees F.	
	Initial	Final	Initial	Final
Coil technic	98.6	106.3	98.6	98.9
Treatment drum technic	98.4	105.8	98.5	98.8
Cuff technic	98.0	105.3	98.4	98.8

and be in actual contact with the cervical tissue, giving temperature readings from the cervix and not the interior portion of the electrode. A large short wave pad was used as the

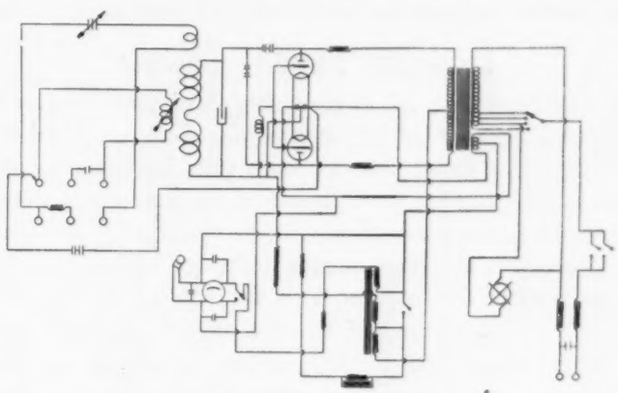


Diagram of circuit.

dispersive electrode and was spaced 2 to 3 inches from the lower part of the abdomen by means of a folded turkish towel. The thermometer was left in position throughout the treatment. The duration of each treatment was thirty minutes.

Average of Six Observations, Orificial Technic

Initial, Degrees F.	Final, Degrees F.
101.5 normal	110.2

Nine other tests were made at another hospital, giving the results shown in the table.

Average of Nine Observations, Orificial Technic

Initial, Degrees F.	Final, Degrees F.
98.6	109.6

In addition, eight fever treatment charts were submitted as evidence of the efficacy of the unit in supplying heat for hyperpyrexia. The Liebel-Flarsheim Fever Cabinet was used.

Average of Eight Observations

Initial, Degrees F.	Time Required to Reach 106 F.
97.9	1 hour 41 minutes

The unit was tried in a clinic acceptable to the Council. It was found to give satisfactory service and to perform in accordance to the claims submitted by the manufacturer.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Liebel-Flarsheim SW2-C Improved Standard Model Short Wave Generator for inclusion in its list of accepted devices.

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SATURDAY, OCTOBER 14, 1939

SIGMUND FREUD: 1856-1939

On September 22, in his eighty-third year, Sigmund Freud, founder of psychoanalysis, died in London. Men in the future may evaluate fully his contribution to medicine. No doubt much of his teaching will be modified and some of it will be discarded. Certain, however, is the revolutionary influence he has had on psychiatry. Freud was born in 1856 in Freiberg, a small provincial town of Moravia, then belonging to the Austro-Hungarian Empire, a son of simple Jewish parents. His nationality and his race influenced his career. He became a physician though later confessing that his secret desire had been to become a novelist. He was destined to be a profound student of human nature.

In his medical studies Freud was stimulated far more by Charcot and Bernheim in France than by his Viennese teachers. The Vienna Medical School was dominated by the mechanistic attitude of Virchow's cellular pathology. In the light of that concept the unity of the human being as manifested in the functioning of the highest integrating centers (personality) was lost. Freud began his medical career as a neurologist, with contributions on aphasia and on infantile cerebral palsy. Like many of his contemporaries, he soon became aware of the sterility, ineffectiveness and fundamental inadequacy of current neurologic practice in the care of the neuroses. In a search for more light he went to Charcot, whose fame was then at its peak. Charcot had demonstrated experimentally that ideas can produce bodily symptoms. By hypnotic suggestions he had succeeded in reproducing artificially in his patients hysterical symptoms similar to those of which they complained spontaneously.

From Bernheim's and Liébeault's post-hypnotic experiments in Nancy Freud learned that unconscious psychologic processes may influence overt behavior. Next came the observations of Joseph Breuer in Vienna, with whom Freud collaborated after his return from France. The real discoverer of psychoanalysis was Breuer's famous patient Anna, who began to talk freely under hypnosis of forgotten experiences. This reminiscing while under hypnosis was not simple remembering. It involved a dramatic display and expression of repressed emotions. This verbal outburst of emotions in hypnosis, which had such a beneficial effect on Anna's hysterical symptoms, Freud and Breuer called "cathartic hypnosis"; Anna herself gave it the name "talking cure."

These two factors, remembering of forgotten traumatic emotional experiences and the expression of pent up emotions, have remained two important therapeutic factors in psychoanalysis. Cathartic hypnosis, however, lacked one important element of modern psychoanalytic technic: insight, the intellectual digestion of the repressed forgotten emotional experiences. Under hypnosis the conscious personality of the patient was entirely eliminated. Freud recognized this defect of hypnotic therapy. He tried to reproduce the procedure without hypnosis and during these attempts discovered the most fundamental dynamic fact of psychology—the fact of repression and resistance. In the waking state patients could not face these repressed emotions which came to the surface in hypnosis. Our resistance toward the recognition of emotions, wishes and tendencies which are painful and in conflict with accepted standards Freud called repression. During patient experimentation between 1895 and 1900 Freud discovered the method of free association by which he was able to circumvent the emotional resistance of patients against facing and recognizing their unconscious motive forces. In free association, conscious control is eliminated. The patient gives free course to his ideas, which drift—now converging toward, now receding from, the pathogenic repressed material. During this procedure, more and more of the unconscious repressed material becomes conscious. The physician's role is not active. His influence on this process of self revelation consists mainly in increasing the patient's courage and confidence to face his real self. Now sexual matters, which had been shunned by physicians and patients but which are nevertheless a significant part of our lives, began to become apparent as determining factors in some psychologic disorders. Challenging the hypocritical attitude of his time, Freud described sexual phenomena objectively. The first rejection with which his views were met was mainly due to the publication of these discoveries.

The aim of psychoanalysis, as Freud conceived it, was not to tell people unpleasant truths about themselves but to cure patients by giving the integrative powers of their rational and conscious personality an opportunity to deal with those psychologic forces which were excluded from their conscious mind. Most important was the discovery that repressions may go back to early childhood, when the infantile ego is too weak to deal with the onslaught of violent emotions. Under certain conditions, when these repressions are too excessive, the repressed impulses find a morbid outlet in

neurotic and psychotic symptoms: irrational fears and ideas, depressions, delusions and the whole gamut of psychopathologic phenomena. Psychoanalytic therapy is based on the principle that the mature conscious ego can deal with repressed emotions which the childish ego cannot tolerate.

Most shocking to contemporary attitudes was the discovery of what Freud called the "family tragedy." Naturally, the first emotional difficulties in which the child becomes involved concern its parents. The typical combination of love and hate which the small child feels toward his parents Freud called the "Oedipus complex." More recently, the application of psychoanalysis to children has become a source of important information about early emotional and intellectual development.

The emotional reactions to the freudian observations and formulations made objective evaluation extremely difficult. They permeated scientific discussions and developed strange accusations. Freud was accused of pansexualism, mysticism, dogmatism and unsound speculation. Moreover, Freud was held responsible for every vagary of his actual disciples and many a pseudoscientist who claimed to speak in his name. He was a pioneer working in an unknown territory—the dynamics of the mind; naturally his first generalizations were somewhat vague groping attempts. Nevertheless many of his observations have already passed the test of scientific scrutiny. The facts of repression, resistance, transference, infantile sexuality and its typical manifestations in family life, the unsconscious emotional origin of psychoneurotic and many psychotic symptoms, the principal laws of psychodynamics as observed in such mechanisms as rationalization, projection and overcompensation form the basis of both normal and morbid psychology.

Sigmund Freud was 35 years old when he returned from Paris to Vienna and laid the foundations of psychoanalysis. Failing to be accepted and supported by his colleagues in Vienna, including at last even Breuer, he worked for ten years entirely alone. Gradually a few students began to gather around him. Among these early followers were Karl Abraham, Sandor Ferenczi, Max Eitingon, Karl Jung, Alfred Adler, Wilhelm Steckel, Otto Rank, Hans Sachs, Ernest Jones, and others whose names did not become so well known. Some of these pupils were unwilling to follow completely along the untrodden paths into which Freud was leading them. Chief among these dissenters were Jung, Adler and Rank. Yet already psychoanalysis has become firmly established in psychology, in education and in medicine. The technic of psychoanalytic therapy has become standardized and is taught to psychiatrists in psychoanalytic institutes. A number of well trained psychoanalysts are united in scientific societies. The effects of emotional factors on physiologic and pathologic processes are being studied by adequate methods. Such generalities as worry, fear and overwork as causes of physical disturbances are being replaced by precise descriptions of the emotional factors. By this pathway Freud's influence on general medicine will be most felt in the future. But his influence on our times cannot be evaluated by restricting attention to the medical implications of his teachings alone. All the scientific fields which deal with man's relation to man and all the social sciences have received a new impetus from his dynamic psychology.

DISTRICT COURT IN TEXAS RULES STATE MAY REQUIRE CITIZENSHIP IN LICENSURE OF PHYSICIANS

Citizenship may lawfully be required by the state of Texas of an applicant for a license to practice medicine, as a condition precedent to the issue of a license, in the opinion of the district court of Travis County, Texas, in a case brought by a citizen of Mexico.[1] Such a requirement was held not to deprive an alien of any right guaranteed him by the federal constitution. As far as available records show, this is the first time that a court has been called on to pass directly on this question. Under the provisions of the constitution a state cannot deny to an alien the right to follow a "common occupation" under the same conditions that it imposes on citizens. The practice of medicine, the Texas court observed, is not "a common occupation" but is a profession impressed in many instances with semiofficial duties.

Physicians have duties in connection with many important matters relating to the public welfare: duties in connection with governmental birth, sickness and death records; with the execution of certificates of inability of witnesses, or even of the defendant, to attend trial; with matters relating to communicable diseases and quarantine; with the execution of certificates of freedom from disease, required by law in connection with the issuance of marriage licenses, and with the enforcement of state and federal narcotic laws, and many other duties of similar nature. All these duties are imposed on physicians by the government in the furtherance of policies adopted by the state for the welfare of the people as a whole. A physician who is a citizen will be better able to cooperate with the state in carrying out its policies than a physician of foreign allegiance and training who is unfamiliar with the ideals and institutions of our country.

In epidemics, the court pointed out, the closest cooperation is required between the medical profession and various governmental agencies. The virtual end of epidemics of many diseases, such as cholera and smallpox, has resulted from the close partnership that has been maintained between the practicing physicians and

1. Manuel Garcia-Godoy v. State Board of Medical Examiners (Texas), in the District Court of Travis County, Texas, 53d Judicial District, No. 61938.

administrative agencies of the state and federal governments. For the preservation of gains that have been made and in the furtherance of similar objectives, the court thought that the legislature had a perfect right to declare it to be of utmost importance that the practice of medicine be limited to citizens. Again, in time of war the services of physicians constitute a necessary and most important link in our fighting forces; the court thought that physicians who have not signified a belief in the fundamental ideals of this country would be in a position to exert a subversive influence tending to undermine and destroy those ideals and to thwart the attainment of the objectives for which we might be fighting. For these and other reasons the court felt that it was within the police power of the state to deny to aliens the right to practice medicine to the end that public health, safety and morals might be furthered and preserved.

The court, incidentally, expressed great difficulty in understanding why Texas had ever permitted examinations for medical licensure to be conducted in any language other than English, believing a thorough knowledge of our language to be of prime importance to a physician if he is fully to understand the information imparted by a patient and if he is adequately to give instructions to that patient.

CITIZENSHIP AS A CONDITION PRECEDENT TO MEDICAL LICENSURE IN THE UNITED STATES[1]

Numerous alien physicians, and particularly physicians from Germany and the nations it has taken over, have been coming into the United States during recent years for permanent residence. In some states difficult situations have been created. During the eight federal fiscal years immediately preceding June 30, 1938, 3,165 immigrant physicians arrived, of whom 1,221 came from Germany and Austria.[2] During the following fiscal year, which ended June 30 last, immigrant physicians numbered 1,384, of whom 819 came from Germany, which during that year included the area formerly known as Austria. During the fiscal year 1931, immigrant physicians numbered 329, while during the fiscal year 1939, just ended, they numbered 1,384.

Statutes and Regulations Governing License to Practice

Citizenship Required		First Papers Required		Neither Citizenship nor First Papers Required
By Statute	By Regulation of Medical Examining Board	By Statute	By Regulation of Medical Examining Board	
Arkansas	Alabama [1]	Connecticut	Colorado [12]	Arizona
Delaware [1]	Iowa [5]	Illinois [7]	Maine	California
Florida	Kansas	Massachusetts [8]	Maryland [12]	District of Columbia
Georgia [2]	Kentucky	New Mexico	Mississippi	Indiana
Idaho	Michigan	New York [9]	North Dakota	Vermont
Louisiana [3]	Minnesota [6]	Pennsylvania	Ohio	
Nebraska	Missouri	Rhode Island [10]	Oregon	
New Hampshire [4]	Montana	Wisconsin [11]	Utah	
New Jersey	Nevada		Virginia	
South Dakota	North Carolina			
Texas	Oklahoma			
Wyoming	South Carolina			
	Tennessee			
	Washington			
	West Virginia			

1. In Alabama and Delaware, citizenship is required of graduates of foreign medical schools.
2. In Georgia, persons who had resided in the state for at least three months prior to March 23, 1939, who were graduates of a medical school approved by the Association of American Medical Colleges or the State Board of Medical Examiners of Georgia, who had practiced in a foreign state or country for at least twenty years and who had filed first citizenship papers may be issued temporary permits valid for six years. If at the end of that period full citizenship is not obtained, no further license may be issued.
3. In Louisiana, temporary permits may be issued to applicants who have taken out first naturalization papers. By board ruling, licentiate must obtain full citizenship within the time limit prescribed by the federal law on penalty of withdrawal of temporary permit.
4. In New Hampshire, citizenship is required of all applicants except citizens of "a Canadian province in which like privilege is granted to citizens of the United States."
5. In Iowa, citizenship is required of graduates of foreign medical schools, except Canadian schools.
6. In Minnesota, citizenship is required of all applicants except citizens of Canada.
7. In Illinois, the law provides that an applicant shall have obtained first citizenship papers "or having made such declaration of intention, has filed a petition for naturalization within thirty days after becoming eligible to do so."
8. In Massachusetts, licentiate must complete naturalization within five years or else the license is revoked.
9. In New York, licentiate must obtain full citizenship in ten years or else his license is revoked.
10. In Rhode Island, by board regulation, licentiate must obtain full citizenship within five years.
11. In Wisconsin, the law provides that an applicant who by reason of his nationality is ineligible to citizenship, who was a graduate of a reputable professional college in the United States prior to June 22, 1933, and who possesses all other qualifications to secure a license, and at least one of whose parents is a native of Wisconsin, shall be licensed.
12. In Colorado and Maryland, first citizenship papers are required of graduates of foreign medical schools.

How and where these 4,549 alien physicians are now located, what they are doing and what their prospects are of establishing themselves in the practice of their profession, if they have not already done so, is not known. Those who have not yet become United States

1. The data in the table and accompanying it, so far as they relate to statutory requirements, have been compiled by the Bureau of Legal Medicine and Legislation from the statutes of the several states. The data relating to regulations promulgated by state boards of medical examiners have been compiled from information supplied the Council on Medical Education and Hospitals of the American Medical Association by the boards of medical examiners of the several states.

2. Immigration of Alien Immigrant Physicians, J. A. M. A. **112**: 737 (Feb. 25) 1939.

citizens or even taken out first papers are confronted by statutes and regulations which, except in four states and the District of Columbia, will bar them from licenses to practice. The various statutes and regulations in force governing the matter are herein briefly summarized.

Current Comment

PITUITARY EXTRACT AND LABOR

Although the use of pituitary extract after delivery and in some instances during the final stage of labor has become almost a routine procedure, the questions relating to its indications or possible harmfulness have not yet been settled. Recent reports serve to reopen this important problem. Williams [1] studied fifty normal primiparas given solution of posterior pituitary immediately after the birth of the child and fifty controls treated in exactly the same manner except for the pituitary. Curiously the incidence of postpartum hemorrhage was more than doubled in the pituitary extract series, although the number of patients was too small to warrant definite conclusions on the etiologic role of the drug. There was an average reduction of about five minutes in duration of the third stage of labor for the pituitary group. One contraction ring was encountered, but whether this was due to uterine manipulations or pituitary extract could not be stated. Percival [2] observed the effects of the intramuscular injection of 5 units of solution of posterior pituitary immediately after the birth of the child in sixty-nine cases of labor. During the same period seventy-four control cases were observed and recorded under similar conditions. He also emphasized that the number of cases studied was too small for the results to carry conviction. As far as the investigation has gone, the intramuscular injection of 5 units of solution of posterior pituitary directly after the birth of the child showed that the duration of the third stage was not appreciably affected, the average loss of blood was less, the incidence of postpartum hemorrhage was less and also there was no tendency for the chorion to be retained; there was no tendency for a contraction ring to form and there was no case of pituitary shock. Clayton [3] found, however, that the average duration of the third stage was slightly shorter in cases in which pituitary was given, that the incidence of postpartum hemorrhage of more than 20 ounces (600 cc.) was not reduced and that there is danger of hour glass spasm of the uterus with the ensuing risk of manual removal of the placenta. The definitely uncertain results of the administration of solution of posterior pituitary as obtained by these observers indicate the need for reviewing the entire question of its routine administration. If pituitary extract can be demonstrated to be without the desired effect and even harmful, it should certainly be omitted as a routine procedure in spite of its present wide acceptance and use.

1. Williams, B. L.: The Effects of Injection of Pituitary Extract Immediately After Delivery, Proc. Roy. Soc. Med. **32**: 920 (June) 1939.
2. Percival, R. C.: On The Effects of Pituitary Extract (Posterior Lobe) in the Third Stage of Labor, Proc. Roy. Soc. Med. **32**: 923 (June) 1939.
3. Clayton, S. G.: The Effects of Injections of Pituitary Extract Immediately After Delivery, Proc. Roy. Soc. Med. **32**: 926 (June) 1939.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Seventh Course on Postgraduate Study.—The committee on postgraduate study of the state medical society offered its seventh course at the University of Arkansas School of Medicine, Little Rock, October 10-11. The speakers included:

Dr. Barnett P. Briggs, Chronic Nontuberculous Infections of the Respiratory Tract.
Dr. Robert Lee Hoffmann, Kansas City, Mo., After Urinary Antiseptics: What About Kidney Infections?
Dr. Paul F. Stookey, Kansas City, Mo., Diagnosis and Treatment of Meningitis.
Dr. Oliver C. Melson, The Role of the Internist in the Care of Patients with Thyroid Disease.
Drs. George V. Lewis and Carl A. Rosenbaum, Surgical Treatment of Hyperthyroidism.
Dr. William R. Brooksher, Fort Smith, Ark., Roentgen Irradiation in the Treatment of Toxic Goiter.
Dr. Edgar V. Allen, Rochester, Minn., Occlusal Disease of the Peripheral Arteries.
Dr. Robert L. Schaefer, Detroit, Clinical Indications of Anterior Pituitary-like Sex Hormone.
Dr. Stuart P. Cromer, dean, The Medical School in a Program of Graduate Medical Instruction.
Dr. Paul C. Williams, Dallas, Texas, A Classification of the Arthritides: A Clinical Demonstration.
Dr. Joy K. Donaldson, Appendicitis: Errors in Management and Educational Needs.
W. E. Hutchison, D.D.S., A Dentist Talks to Physician Friends.
Drs. Paul L. Mahoney and John S. Agar, Effects of Drugs in the Nose.

CALIFORNIA

Lectures on Family Relations.—A series of lectures on family relations is being offered at the University of California in Wheeler Auditorium, Berkeley, Tuesday afternoons at 4 o'clock. The lectures are designed among other things, to clarify personal and emotional factors associated with sex and human relations, to survey objectively a demonstrable situation regarding sex and society and to consider means of applying this knowledge to individual and social welfare. Chauncey D. Leake, Ph.D., professor of pharmacology at the university's medical school, will direct the series.

Lectures on Mental Hygiene.—The Mental Hygiene Society of Northern California will present a series of lectures on "Mental Health in Action" at the Mount Zion Auditorium, San Francisco. The speakers will be:

Dr. Walter L. Treadway, U. S. Public Health Service, San Francisco, October 18, The Poor, the Sick, the Bad.
Ernest R. Hilgard, Ph.D., Stanford University, October 25, Motives in Industry.
Dr. Herbert E. Chamberlain, Sacramento, November 1, Mental Hygiene in Daily Life.
Dr. Jacob Kasanin, San Francisco, November 8, Psychoanalysis and Mental Health.
Norman Fenton, Ph.D., Stanford University, Calif., November 15, Mental Hygiene and the Teacher.

DISTRICT OF COLUMBIA

University News.—Dr. George W. Thorn, Baltimore, lectured before the naval medical and dental officers on duty in the District and vicinity October 9 on "Supportive Treatment of Infections."

New Department of Psychology and Psychiatry.—The Catholic University of America, Washington, recently created a department of psychology and psychiatry under a grant from the Rockefeller Foundation. The work of the department of psychology, which had been in existence since the founding of the university, has been extended to form the department of psychology and psychiatry. Dr. Thomas V. Moore is head of the department.

Society News.—The Urological Society of the District of Columbia will be addressed by Drs. James T. Priestley, Rochester, Minn., November 8, on "Surgical Procedures in Urology."——At a meeting of the Washington Heart Association November 15 Dr. Tinsley R. Harrison, Nashville, Tenn., will discuss recent advancements in the study of hypertension and renal disease.——Dr. Nolan D. C. Lewis, New York, addressed the section on gastro-enterology of the Medical Society of the District of Columbia October 2 on "The Nervous and Mental Signs of Gastrointestinal Disorders."

ILLINOIS

Postgraduate Instruction in Down State Cities. — A new program of postgraduate education has been adopted by the Illinois State Medical Society which will include several one-day conferences to be held in certain cities of the state. The first conference will be held at the Dunlap Hotel, Jacksonville, November 9, with the following program given by Chicago physicians:

Dr. Robert S. Berghoff, Heart Disease.
Dr. Warren H. Cole, General Surgery.
Dr. Cleveland J. White, Dermatology.
Dr. Philip H. Kreuscher, Orthopedic Sugery.
Dr. Julius H. Hess, Pediatrics.
Howard J. Shaughnessy, Ph.D., Public Health.
Dr. James H. Hutton, Endocrinology.
Dr. Frederick H. Falls, Obstetrics.

Each paper will be followed by discussions. Additional details may be obtained from Dr. Frank Garm Norbury, Jacksonville, or Dr. Berghoff, 30 North Michigan Avenue, Chicago.

Chicago

Seminars on Psychologic Problems. — Dr. Franz Alexander, director, Institute for Psychoanalysis, will conduct the first of a series of five seminars for physicians on "Psychologic Problems in General Medical Practice" October 17. Other lecturers will be:

Dr. Helen Vincent McLean, October 31, Neurotic Gains from Illness.
Dr. Thomas M. French, November 14, Psychologic Aspects of Asthma.
Dr. Leon J. Saul, November 28, Psychologic Aspects of Hypertension.
Dr. Therese Benedek, December 12, Premenstrual Emotional Difficulties.

Clinical Heart Session.—The clinical section of the Chicago Heart Association will hold its first meeting of the season at Michael Reese Hospital October 27. Among the participants will be Dr. Soma Weiss, professor of medicine, Harvard Medical School, Boston. Subsequent meetings of the section will be held monthly at one of the heart clinics of the city. Questions should be sent to Dr. Clayton J. Lundy, secretary of the clinical section, Chicago Heart Association, 203 North Wabash Avenue.

Technical Adviser Appointed on Industrial Hygiene.— Dr. Ludwig Teleky, formerly of Düsseldorf, Germany, has been appointed technical adviser to the division of occupational hygiene of the state department of public welfare, where he will be associated with Dr. Milton H. Kronenberg, chief of the division. Dr. Teleky graduated at the University of Vienna in 1896. He has served as honorary secretary of the Austrian Central Organization for Prevention of Tuberculosis and editor of its journal and as medical expert in the Workers Accident Insurance of Vienna and Lower Austria. In 1939 Dr. Teleky was awarded the Devoto prize of the Reale Instituto Lombardo di Science and letters in Milano for the best publication in industrial hygiene.

Society News.—At a meeting of the Chicago Laryngological and Otological Society October 2 the speakers were Drs. Chevalier L. Jackson, Philadelphia, on "Surgical Treatment of Cancer of the Larynx" and Elmer W. Hagens, "Pathology of the Inner Ear in a Case of Deafness from Cerebro-Spinal Meningitis."——The Illinois Psychiatric Society was addressed October 5 by Max K. Horwitt, Ph.D., and Drs. Erich Liebert and George A. Wiltrakis, Elgin, Ill., on "Metabolism of the Brain Before and After Insulin and Metrazol Treatment as Determined by Oxygen and Carbon Dioxide Content of the Blood"; Maxwell Gitelson, "Concerning the Direct Psychotherapy of Children," and Jules H. Masserman, "Use of Phantasy Tests in Differential Psychiatric Diagnosis."——Dr. Ernest A. Pribram discussed "Management of Diabetes Based on Modern Conception of Carbohydrate Metabolism" before the German Medical Society of Chicago October 3.

Rush College to Be a Graduate School. — Plans are under way to establish a center for graduate training at Rush Medical College within the near future. This announcement was made simultaneously with the news that undergraduate work will be discontinued at Rush in 1942, to provide completion of training for the class entering the autumn session in 1940. Undergraduate training will be continued at the Department of Medicine of the University of Chicago, and after 1942 will be offered there exclusively. The board of managers of Presbyterian Hospital, the teaching unit of Rush, has voted that the hospital remain in its present location on the west side of Chicago. According to a release from the school, decision to establish Rush as a center of graduate medical training terminates discussions as to the ultimate status of Rush, which have been carried on intermittently since 1916. In that year the university approved plans for the south side school which was opened in the autumn of 1927. Rush was chartered in 1837 and has been in operation since 1842, merging with the University of Chicago in 1924 after twenty-six years' affiliation.

KANSAS

Cancer Program.—A statewide lay education program on skin cancer will be carried out during 1939-1940 under the auspices of the Kansas Federation of Women's Clubs, the Women's Field Army of the American Society for the Control of Cancer and the Kansas Medical Society. An effort will be made to present programs in every town in the state with the local county medical society participating.

Society News.—The Shawnee County Medical Society was addressed in Topeka October 2 by Dr. Paul C. Colonna, Oklahoma City, on "Diagnosis and Treatment of Acute Hematogenous Osteomyelitis." —— At a meeting of the Golden Belt Medical Society in McPherson October 12, the speakers were Drs. Letteer G. H. Lewis, McPherson, on "Vitamin K in Relation to Biliary Tract Disease"; Murray C. Eddy, Hays, "Management of Gallbladder and Biliary Tract Disease from the Standpoint of the Surgeon"; Cecil D. Snyder, Winfield, "Gastric Surgery," and Francis A. Carmichael Jr., Kansas City, "Low Back Pain from the Standpoint of the Neurosurgeon."

MAINE

Annual Fall Clinic.—The Maine Medical Association will hold its annual fall clinical session at Waterville October 25-26. Meetings will be held at the Sisters, Thayer and Elm City hospitals. Wednesday evening there will be a panel discussion on modern anesthesia with the following speakers: Drs. Frederick T. Hill, Waterville, chairman; Howard M. Clute, Marion Fletcher Eades and Sidney C. Wiggin of Boston; Gilbert Clapperton, Lewiston, and Paluel J. Flagg, New York. The session Thursday evening will be the regular meeting of the Kennebec County Medical Society, with Dr. Elliott C. Joslin, Boston, discussing diabetes.

MICHIGAN

Society News. — Dr. Lawrence W. Smith, Philadelphia, discussed "Temperature Factors in Cancer and Embryonal Cell Growths" before the Wayne County Medical Society October 9. Dr. Russell L. Haden, Cleveland, will speak October 16 on "The Etiology and Diagnosis of Leukemia."

Neurologic Society Changes Name.—At its first annual meeting in Rochester September 28, the Detroit Society of Neurology and Psychiatry officially changed its name to the Michigan Society of Neurology and Psychiatry. The speakers at the meeting included Drs. Louis A. Schwartz on "An Analyzed Case of Hypertension" and James Clark Moloney, "Comments on the Unconscious."

Field Consultant in Pediatrics.—Dr. Warren E. Wheeler, Dayton, Ohio, has been appointed to the staff of the bureau of maternal and child health of the state department of health as field consultant in pediatrics. His services will be available to local health departments and medical societies on request. The appointment of Dr. Wheeler is a part of the state society's program of postgraduate education for physicians throughout the state (THE JOURNAL, August 5, p. 517). Dr. Wheeler graduated at Harvard Medical School, Boston, in 1933.

MINNESOTA

Society News.—The Minnesota Academy of Medicine was addressed in St. Paul October 11 by Dr. Lee W. Barry on the various types of cesarean section.——Dr. James S. Reynolds, Minneapolis, discussed blindness before the Hennepin County Medical Society at its first meeting of the season in Minneapolis October 2.——At a meeting of the Minneapolis Surgical Society October 5 Dr. Arthur R. Metz, Chicago, spoke on "Chronic Duodenal Stasis."——Dr. Jens E. Meulengracht, Copenhagen, discussed "Principles Underlying the Treatment of Hemorrhagic Peptic Ulcer" in a Mayo Foundation lecture in Rochester August 31. Dr. Meulengracht is chief of Bispebjerg Hospital and professor of medicine in the University of Copenhagen.

MISSOURI

New Trachoma Hospital.—The cornerstone of the new Missouri Trachoma Hospital, Rolla, was laid recently. The speakers included Dr. Arthur T. McCormack, Louisville, Ky., commissioner of health of Kentucky, and Governor Lloyd C. Stark. The Missouri State Medical Association was represented by Dr. Eldon C. Bohrer, West Plains. The hospital is located west of Rolla on a five acre tract. When com-

pleted, the T shaped building will have a capacity of seventy beds with laboratories, equipment for visual training, recreation and assembly room. It will cost $136,000.

Society News.—At a meeting of the St. Louis Medical Society September 26 the speakers were Drs. Louis L. Tureen and John Albert Key on "Fractures of the Vertebrae During Metrazol Therapy"; Paul O. Hageman, "Treatment of Streptococcic Infections," and William B. Kountz, "Treatment of Peripheral Vascular Diseases."——Drs. Alexis F. Hartmann and Henry L. Barnett, St. Louis, discussed sulfanilamide before the Jackson County Medical Society September 26.—— Dr. Thomas G. Miller, Philadelphia, will address the Kansas City Academy of Medicine October 20 on "Recent Advances in Gastroenterology."——At a meeting of the Kansas City Southwest Pediatrics Society September 19 the speakers were Drs. Francis A. Carmichael Jr. and Edwin H. Schorer on "Diagnosis of Cerebral Conditions in Childhood" and "The Business Side of Pediatrics" respectively.——Dr. Thomas M. Paul, St. Joseph, discussed "The Physiologic Basis for the Therapeutic Effects of 'Splenic Extract'" before the Buchanan County Medical Society, St. Joseph, October 4.

NEW JERSEY

Society News.—Dr. William Goldring, New York, will address the Academy of Medicine of Northern New Jersey, Newark, October 19 on "Clinical Aspects of Hypertension and Arterial Heart Disease." Dr. John H. Garlock, New York, will address the section on surgery October 24 on "Surgical Treatment of Carcinoma of the Thoracic Esophagus."

Changes in State Board of Health.—Drs. Frederick P. Lee, Paterson, and Walter G. Alexander, Orange, have been appointed members of the state board of health. Robert P. Fischelis, Phar.D., secretary of the state board of pharmacy, has also been appointed a member of the board under a new law increasing the membership to include a registered pharmacist.

NEW YORK

Society News.—Capt. Rollin L. Bauchspies, M. C., U. S. Army, assistant professor of military science and tactics, Syracuse University School of Medicine, addressed the Onondaga County Medical Society, Syracuse, October 3 on "Medical Service of the U. S. Army in the Field."——Drs. Joseph R. Wiseman and David F. Gillette, among others, will address the Syracuse Academy of Medicine October 17 on "Drug Allergy with Specific Reference to Tryparsamide."—— Drs. Gordon D. Hoople, Syracuse, and Marguerite P. McCarthy, Solvay, addressed the Allergy Society of Syracuse October 11 on "Bronchoscopy in the Diagnosis and Treatment of Asthma" and "Analysis of Results in Treated Hay Fever Patients at the Allergy Clinic" respectively.——Dr. Norman H. Jolliffe, New York, addressed the Medical Society of the County of Nassau, Garden City, September 26 on "Recent Advances in Vitamin Therapy (Vitamin B Complex)."——Dr. Philip L. Forster, Albany, addressed the Medical Society of the County of Albany September 27 on "Fat Embolism."——Dr. John H. Ferguson, Syracuse, addressed the annual joint meeting of the Syracuse Academy of Medicine with the Utica Academy of Medicine at the Teugega Golf Club in Rome September 21 on "Crime Detection and the Doctor."

New York City

First Harvey Lecture.—Dr. Arne W. K. Tiselius, Uppsala University, Uppsala, Sweden, will deliver the first Harvey Society Lecture of the current series at the New York Academy of Medicine October 19 on "Electrophoretic Analysis and the Constitution of Native Fluids."

Medicine in Newspaper Forum Program.—One session of the ninth annual Forum on Current Problems sponsored by the New York *Herald-Tribune*, which will be held at the Waldorf-Astoria October 24-26, will be devoted to "Science on the Side of Civilization." Arthur H. Compton, Ph.D., professor of physics, University of Chicago, will give the keynote address, and the other speakers will be Drs. Perrin H. Long, Baltimore, on the development of sulfanilamide in treatment of disease; Francis Carter Wood, New York, progress in the treatment and control of cancer, and Allan Roy Dafoe, Callander, Ont., physician to the Dionne quintuplets, "Better Citizens Through Stronger Children."

The Twelfth Graduate Fortnight.—The twelfth Graduate Fortnight of the New York Academy of Medicine will be held October 23 to November 3. The subject will be "The Endocrine Glands and Their Disorders." There will be round table conferences at the academy building each morning and clinics at hospitals in the afternoons. Evening sessions will be held at the academy with the following speakers:

Dr. Herbert M. Evans, Berkeley, Calif., Historical Sketch of the Development of Endocrinology.
Dr. James B. Collip, Montreal, Can., Physiology of the Anterior Lobe of the Pituitary Gland.
Dr. Leopold Lichtwitz, New York, Pituitary Hypothalamic Syndromes.
Dr. Leo M. Davidoff, Brooklyn, Hypopituitarism and Hyperpituitarism.
Dr. Elmer L. Sevringhaus, Madison, Wis., Therapeutic Application of Female Sex Hormones.
Dr. David Marine, New York, Physiology and Principal Interrelations of the Thyroid.
Dr. James H. Means, Boston, Hypothyroidism.
Dr. Harold Thomas Hyman, New York, Medical Aspects of Hyperthyroidism.
Dr. Frank H. Lahey, Boston, Surgical Treatment of Hyperthyroidism and Other Diseases of the Thyroid Gland.
Dr. Walter B. Cannon, Boston, The Adrenal Medulla.
Dr. Robert F. Loeb, New York, Adrenal Insufficiency.
Dr. Cyril N. H. Long, New Haven, Conn., The Adrenal Cortex.
Dr. Bernard S. Oppenheimer, New York, The Cushing Syndrome: Neoplasms of the Adrenal Gland.
Dr. Hugh H. Young, Baltimore, Overfunction of the Adrenal Cortex.
Dr. Rollin T. Woodyatt, Chicago, Relation of Diabetes to the Endocrine System.
Dr. John F. Fulton, New Haven, Conn., The Influence of the Central Nervous System upon Endocrine Activity.
Dr. William G. MacCallum, Baltimore, Physiology and Pathology of Parathyroids.
Dr. Henry L. Jaffe, New York, Hyperparathyroidism.
Philip E. Smith, Ph.D., New York, Physiology of the Ovaries.
Carl R. Moore, Ph.D., Physiology of Testes and Therapeutic Application of Male Sex Hormones.
Dr. Robert T. Frank, New York, Puberty, Menstruation and Pregnancy.
Dr. Ephraim Shorr, New York, Menopause.

Several of the programs for the evening sessions were arranged in cooperation with other medical societies and sections of the academy.

NORTH CAROLINA

Symposium on Diseases of the Lungs.—A three day symposium on diseases of the lungs and thorax will be held at Duke University School of Medicine and Duke Hospital, Durham, October 19-21. The speakers will include:

Dr. Edward C. Churchill, Boston, Anatomical and Physiological Considerations Involved in the Surgical Treatment of Intrathoracic Lesions.
Dr. Frederick T. Lord, Boston, Clinical Aspects and Diagnosis of Pulmonary Lesions.
Dr. Daniel M. Brumfiel, Saranac Lake, N. Y., Pneumoconiosis.
Dr. Chester A. Stewart, Minneapolis, Evolution of Tuberculosis in Children.
Dr. Harry A. Bray, Ray Brook, N. Y., Clinical Diagnosis of Early Pulmonary Tuberculosis.
Dr. Cameron Haight, Ann Arbor, Mich., Surgical Treatment of Pulmonary Tuberculosis.
Dr. William DeW. Andrus, New York, Mediastinal and Other Thoracic Tumors.
Dr. Isaac A. Bigger, Richmond, Va., Trauma to the Thorax.
Dr. Charles R. Austrian, Baltimore, Medical Treatment of Suppurative Diseases of the Lungs.
Dr. Dickinson W. Richards Jr., New York, Pulmonary Fibrosis and Emphysema: Recent Methods of Diagnosis and Treatment.
Dr. William F. Rienhoff Jr., Baltimore, Surgical Treatment of Lung Abscess and Bronchiectasis.
Dr. Stuart W. Harrington, Rochester, Minn., Clinical Manifestations and Surgical Treatment of Diaphragmatic Hernia.
Dr. Maxwell Finland, Boston, Treatment of Pneumonia.
Dr. Daniel C. Elkin, Atlanta, Ga., Postoperative Pulmonary Complications.
Dr. Gabriel Tucker, Philadelphia, Bronchoscopy in the Diagnosis and Treatment of Intrathoracic Disease.

OREGON

Society News.—Dr. Conrad A. Loehner, Salem, addressed the Lane County Medical Society, Cottage Grove, September 17 on "Barbiturates and Hypnotics."——Dr. Peter H. Rozendal, Klamath Falls, was elected president of the state association of city and county health officers at the annual meeting in Portland September 1-2. Drs. David R. Rich, La Grande, and Walter H. MacDougall, Oswego, were elected vice presidents and A. Edward Bostrom, Portland, reelected secretary.

Lectures by Dr. Goodpasture.—A series of lectures will be given by Dr. Ernest W. Goodpasture, professor of pathology, Vanderbilt University School of Medicine, Nashville, Tenn., before the Portland Academy of Medicine October 23-25. His subjects will be: "Investigations of Virus Infections and Immunity by Means of Chick Embryo Technic"; "Experimental Bacterial Infections of the Chick Embryo," and "A Consideration of Pathogenesis of Virus and Bacterial Infection, with a Review of Some Virus Diseases."

PENNSYLVANIA

Personal.—Dr. Tom Outland, Sayre, Pa., has been appointed chief surgeon at the Elizabethtown State Hospital for Crippled Children to succeed Dr. James R. Martin, who was appointed James Edwards professor of orthopedic surgery at Jefferson Medical College, Philadelphia (THE JOURNAL, August 26, p. 866).——Dr. Theodore Wollak, superintendent of the Torrance State Hospital, Torrance, since 1936, has resigned, it is reported.

Society News.—Dr. Carl J. Wiggers, Cleveland, addressed the Washington County Medical Society, Washington, September 13 on "Physiology in the Practice of Medicine."——At the first fall meeting of the Dauphin County Medical Society, Harrisburg, September 5 the speakers are Drs. Ross H. Childerhose, on "Diagnostic Features and Modern Medical Treatment of Tuberculosis"; William Devitt, Allenwood, "Surgical Treatment of Tuberculosis," and Clarence R. Phillips, "Proper Relationship Between the Lay Organization and the Medical Society."

UTAH

Dr. Freudenberger Named Acting Dean.—Clay B. Freudenberger, Ph.D., professor of anatomy, University of Utah School of Medicine, Salt Lake City, has been appointed acting dean during the absence of Dr. Lyman L. Daines, dean, who has been seriously ill since early in September. News at the university includes the promotion of Dr. Edward I. Hashimoto as assistant professor of anatomy, and the construction of an addition to the medical school building which will increase the facilities by 50 per cent, it is reported.

Hobby Show.—The Salt Lake County Medical Society devoted its meeting September 11 to a hobby show. Under the leadership of Dr. Fuller B. Bailey, the following, among others, displayed their work: Drs. George A. Allen "Live Birds"; Quince B. Coray, "Painting and Charcoal Drawings"; Orlindo L. Ross, James Albert Peterson and Edward S. Pomeroy, "Water Colors and Paintings," and Thomas F. Welsh and Ralph C. Pendleton, "Photography."

State Medical Election.—Dr. Alfred C. Callister, Salt Lake City, was chosen president-elect of the Utah State Medical Association at a meeting of the house of delegates at the University of Utah, Salt Lake City, September 4. Other officers include: Drs. Warren O. Christenson, Wellsville, Edwin M. Neher, Salt Lake City, Wilford J. Reichmann, St. George, David E. Ostler, Richfield, vice presidents; David G. Edmunds, Salt Lake City, secretary; Richard P. Middleton, Salt Lake City, treasurer. The next meeting of the state association will be held in Ogden in 1940.

Control of Venereal Disease.—The state department of health has established a bureau of venereal disease control to cooperate with the U. S. Public Health Service in launching a statewide program. Dr. Welby W. Bigelow, Salt Lake City, has been named director of the bureau. Subsidized by federal funds, the state board has adopted a revised system of reporting venereal diseases, and the distribution of free antisyphilitic drugs for indigents and those in low income groups is being made available to regularly licensed physicians. To facilitate reporting as well as free antisyphilitic drug distribution to the private physicians, a system has been set up whereby the physicians will report cases to and receive drugs from their respective district health officers except in Davis and Salt Lake counties. Physicians in these counties will apply respectively to the Davis County health department at Farmington and to the state board of health in Salt Lake City. District health offices are located at Ogden, Cedar City, Price, Provo and Richfield.

GENERAL

Reprints on Infantile Paralysis.—A limited number of bulletins entitled "Care During the Recovery Period in Paralytic Poliomyelitis" are available for distribution by the National Foundation for Infantile Paralysis. No charge will be made. The association is sending copies to members of the American Academy of Orthopedics and the American Orthopedic Association, but interested physicians may have them on request. The brochure is technically designated "Public Health Bulletin No. 242, Revised 1939," U. S. Public Health Service. Requests should be directed to the foundation at 120 Broadway, New York.

Leaflet for Patients Explains Gonorrhea.—The U. S. Public Health Service has issued a leaflet entitled "Gonorrhea the Crippler," designed for physicians to distribute to their patients. The division of venereal diseases prepared it in response to a recommendation by an advisory committee in January 1938, urging the development of a campaign for education of the public and issuance of printed materials. The text explains the symptoms, points out the fallacies of several common beliefs and gives practical advice, with emphasis on care by a physician. This folder is one of a "dollar-a-hundred" series on venereal disease published by the service. It is available from the Superintendent of Documents, Washington, D. C., at $1 a hundred copies.

Aero Medical Meeting.—The eleventh annual meeting of the Aero Medical Association of the United States will be held at Hollywood-by-the-Sea, Florida, November 3-5, with headquarters at the Hollywood Beach Hotel. The speakers on the scientific program include:

Dr. Charles L. Leedham, Randolph Field, Tex., The Syndrome of Vasomotor Instability as Seen in Examination of Cadet Applicants for Flying.

Ross A. McFarland, Ph.D., Boston; Dr. Ashton Graybiel, Boston; Dr. Eric Liljencrantz, San Francisco; Col. Arnold D. Tuttle, Chicago, An Analysis of the Physiologic and Psychologic Characteristics of Two Hundred Civil Air Line Pilots.

Lieut. Comdr. William W. Davies Jr., Pensacola, Fla., Some Observations on Cadet Selection.

One feature of the program will be a forum on airline medical problems.

Meeting of Health Officers.—The annual institute of instruction on the practical administrative affairs of the health officer will constitute the yearly session of the International Society of Medical Health Officers in Pittsburgh October 16. The session will be in cooperation with the health officers' section of the American Public Health Association. Among the speakers will be:

Edward Henry Lewinski Corwin, Ph.D., The Problem of Cost Accounting in Public Health.

Dr. Huntington Williams, Baltimore, Practical Staff Policies of a Health Department.

Dr. John L. Rice, New York, Increasing Administrative Efficiency.

Henry F. Vaughan, Dr.P.H., Detroit, Organizing the Health Department for an Epidemic.

Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., will speak.

New Society of Physical Therapy Physicians.—Dr. Frank H. Ewerhardt, St. Louis, and Dr. William Bierman, New York, were chosen president and president-elect respectively of the Society of Physical Therapy Physicians at its organization and first annual meeting during the annual session of the American Congress of Physical Therapy in New York September 5-8. Other officers include Drs. Frank H. Krusen, Rochester, Minn., and John S. Coulter, Chicago, vice president and secretary-treasurer respectively. Although the group met informally in 1938, the society was not officially organized until the recent meeting. Its membership will be restricted to physicians who devote themselves exclusively to the practice of physical therapy in contradistinction to those of the American Congress of Physical Therapy, which includes all ethical physicians and surgeons who are interested in physical therapy while engaged in general practice. The membership will be limited to 100 bona fide specialists who have devoted at least five years to this specialty and have or are holding teaching and directoral positions in physical therapy in America. Membership will be offered to qualified men by individual invitation, according to the *Archives of Physical Therapy*. The 1940 session will be held separately but during the annual session of the congress at Cleveland.

Government Services

Physicians Wanted for the CCC

Vacancies now exist in the CCC in the eighth corps area wherein the services of physicians can be utilized as civilian employees (physicians) or as contract physicians. Applicants should be graduates of approved medical schools and should address their applications to the surgeon, eighth corps area, Fort Sam Houston, Texas. Consideration will be given to applicants as follows: (1) Medical reserve officers who are eligible for active duty and promotion. They may be placed on duty under classification P-2 at the initial rate of pay of $2,600 per year. (2) Physicians who are not members of the medical reserve corps can be placed on duty as contract physicians at the initial rate of pay of $2,600 per year. Applicants must consider themselves physically qualified; if selected, they must report to their first place of assignment at their own expense and if found physically qualified will be appointed at the respective rates. If on being relieved from duty, either at the request of the individual or for the convenience of the government, the return transportation must also be at the expense of the individual.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 23, 1939.

The London Hospitals in Wartime

The London hospitals have been cleared as far as possible of ordinary patients, mainly with the object of transferring them to places safer from air raids and also to provide accommodations for the large number of casualties expected from this cause. But they still maintain 20 per cent of their accommodations for cases of urgent illness or casualties apart from air raids. One restriction is imposed: only cases from the district in which the hospital is situated are admitted. In normal times the reputation of the hospitals drew patients from far and wide, even from overseas. Operations are now performed in rooms specially equipped on the lower floors. A limited outpatient service is maintained. The enormous medical machine which was created almost overnight for the treatment of casualties from air raids is kept "ticking over." In certain directions medical services are necessarily curtailed. The use of radium is an example. Most of the national stock of radium has been buried at the foot of a 50 foot hole specially drilled for use in war time at one of the hospitals. The radium and its containers are in a steel cylinder, which before being lowered was loaded at the well head by an operator who stood for protection behind a thick block of lead. This valuable stock of radium is thus protected against risk of accident not only with the object of preserving it but as a safeguard against the damage which might be caused if it should be scattered by an explosion. For the present, high voltage roentgen therapy will be used instead of radium treatment wherever possible. The resumption of radium treatment in some parts of the country will soon be considered.

The Use of Poison Gas and Bacteria in War

In the House of Lords, Viscount Halifax, Secretary of State for Foreign Affairs, stated that the British ambassador in Berlin, when asking for his passports from the German government, presented a note inquiring whether the Geneva Gas Protocol of 1925, which prohibits the use of poisonous gas and bacteriologic methods, would be observed by the German government. That government had now replied in the affirmative through the Swiss minister in London as follows: "The German government will observe for the duration of the war the prohibitions which form the subject of the Geneva Protocol. It reserves full liberty of action in the event of the provisions of the protocol being infringed by the enemy." But we are taking no risks in this matter. Not only the fighting forces but every civilian has a gas mask, and in London no one goes any distance without taking his mask. There are special ones for young children and for babies, who could not wear an ordinary mask, a protective helmet in which air is kept circulating by a bellows. Instruction in the use of this helmet is given daily to mothers at the centers for air raid precautions.

The Need for Pharmaceutic Reform

At the British pharmaceutic conference Mr. J. Rutherford Hall referred in his presidential address to the misleading and fraudulent advertisements of nostrums which the government did not control in any way. There was need for some central authority to recognize proper and reliable medicaments. A combination of the British Pharmacopeia and the United States Pharmacopeia might be the first stage in securing a Universal Pharmacopeia. But this did not solve the whole difficulty in settling what were proper and reliable medicaments. New drugs and methods of treatment were being constantly introduced. Some standing authority was therefore necessary, with power to act and make recognitions and regulations as occasions arose. He had in mind some such body as the Council on Pharmacy and Chemistry of the American Medical Association, which published an approved list of new and nonofficial remedies, the purpose of which was to protect the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connection with proprietary medicines. Such a body, to be effective, would need legal sanction.

The welter of names and the confused nomenclature of medicaments called loudly for some simplification. The same substance should not be put on the market under different proprietary names. There should also be some limit to the putting up of known substances under a proprietary name and so overloading the pharmacy shelves. The public was protected against poisoning by the Pharmacy and Poisons Act, which confined the sale of poisons to duly qualified pharmacists. There was a strong case for much wider control. It would be in the interest of the community that the dispensing and distribution of all medicaments should be similarly confined to pharmacists. Though they might know little or nothing about pathology and should not presume to diagnose or prescribe, they knew enough to be able to warn a purchaser that the article he wanted was contraindicated.

Red Cross Relief Fund

The British Red Cross Society has issued an appeal for funds, stating that in this war it is certain there will be vast suffering and distress and that the relief of the sick and wounded of the fighting forces and of the civilian population will call for much voluntary effort and financial support. Considerable voluntary help has already been secured, but it remains to find the money necessary to pursue the work. In the great war and indeed at all times appeals made by the British Red Cross Society have obtained a good response. Though the fund was opened only a few days ago, $375,000 has already been subscribed. Individual donations are as high as $5,000.

Royal College of Surgeons Takes Precautions Against Air Raids

The more valuable contents of London's museums, libraries and art galleries which would be irreplacable if destroyed by air raids have been removed to places of safety in basements or to the country. The world-famous Hunterian collection of surgical specimens at the Royal College of Surgeons has been removed to a bomb-proof vault in the college basement. All the more important manuscripts, books and pictures in the college library have been sent to the country.

BERLIN

(From Our Regular Correspondent)

Aug. 24, 1939.

Meeting of Neurologists and Psychiatrists

The Society of German Neurologists and Psychiatrists met this year in Wiesbaden. The president, Professor Rüdin, Munich, pointed out that psychiatry in its efforts for improving racial hygiene performed a timely and progressive service. He credited psychiatry with having been the first division of medicine to point out to the state and the national socialist party the dangers latent in psychopathic persons and to give impetus to the well known legal measures taken. It is fallacious to assume, he said, that psychiatry would become increasingly superfluous, because psychopaths according to the laws governing racial hygiene would soon die out. This assumption involves the danger of deterioration for the psychiatric profession, whereas psychiatry requires the most competent physicians, because it deals with many dangerously ill with hereditary psychoses. "The individual therapeutist may bungle and mar

one or two human lives, but a poor psychiatrist, whole generations." Rüdin warned against undermining the reputation of psychiatrists.

Scientific attention was given, especially, to the psychic disorders attending advancing years. Max Bürger, the Leipzig clinician, treated the subject from the pathophysiologic point of view. He pointed out, as the basis of his own investigations, that processes characteristic of old age begin in youth and represent a basic phenomenon of life. Ferdinand Kehrer, psychiatrist in Münster, treated the subject from the clinical point of view and presented a systematic account of mental diseases in later life. A. von Braunmühl, Eglfing, Bavaria, showed how precipitations and swellings, modifications in the dispersion rate of the colloidal brain substance and other changes of a colloid chemical nature manifest themselves. G. Gischof-Kutzenberg spoke on the hereditary relations of the psychoses of advancing years. A special position must be accorded to involutional depressions. Our knowledge, he said, of climacteric and presenile psychoses is still fragmentary. Besides, it appears that manic-depressive psychoses that make their first appearance in advancing years require special classifications and do not fit in the frame of hereditary manic-depressive insanity.

Seventieth Birthday of Prof. F. K. Kleine

One of the most deserving of German tropical scientists and for many years collaborator of Robert Koch, Prof. Friedrich Karl Kleine, has celebrated his seventieth birthday, far from his native land, in San Carlos on Fernando Poo (Spanish West Africa), where he is engaged in research work. When an officer in the public health service he was ordered in 1900 to report to the Robert Koch Institute in Berlin, where he soon became a co-worker of Robert Koch in his investigations of the significance of tuberculosis of cattle for human beings. In 1903-1904 he accompanied Koch to Rhodesia and Egypt on the expedition to study coastal fever in cattle and in 1906-1907 to East Africa to study trypanosomiasis. In 1908-1913 Kleine was in charge of the German campaign in East Africa for combating trypanosomiasis and was extraordinarily successful in his scientific activity. The best known result of this activity was the discovery that the agent must pass in the tsetse fly through an evolution similar to that of the malarial parasite in the anopheles mosquito. During the World War Kleine was ranking physician of the German forces in Cameroon. After the war he became divisional director and subsequently president of the Robert Koch Institute for Infectious Diseases in Berlin until his retirement from public service in 1934 on reaching the retirement age. Kleine enjoys an international reputation.

Small Families of Physicians

According to a report that appeared in Volk und Rasse, families of physicians are among the smallest of the German population. In 1938 about 21 per cent of the 27,800 physicians of Germany, exclusive of Austria and the Sudetenland, had no children. Fifty per cent had only one or two children; only 23 per cent had three or four children. Large families of five or six children were found in only 4.5 per cent. Conditions in Berlin, Munich and Leipzig were especially bad. Berlin with 32.2 per cent and Munich with 32 per cent showed the largest percentages in marriages without children.

Diabetic Retinitis

Dr. Reinhold Braun has treated diabetic retinitis in a critical examination of the 770 diabetic patients in Professor Umber's ward in the Hospital Westend in Berlin. One hundred and fifteen of these patients had modifications of the retina. Insulin produced no change. Older patients and those with serious diabetes were more frequently affected than younger ones. Of the factors contributing to metabolic disturbances in diabetes, acidosis and the secretion of ketone bodies seem to be most causative of diabetic retinitis. Perhaps changes in the vascular system of the retina play a part; hypertonia is not involved. Moreover, a certain effect on the evolution of diabetic retinitis seems also to be attributable to the excretory functioning of the kidneys and to disturbances in the sympathetic nervous system and in the balance between the hormones of Langerhans' islands and the chromaffin system. Treatment of diabetic retinitis is almost completely unavailing; however, insulin is in no wise injurious to the retina.

Tuberculosis Among Sailors

The fight against tuberculosis occupies a prominent position in the hygienic welfare work connected with social insurance. The sailors' vocation is not favorable to tuberculous men, but quite the contrary, because of the strenuous work and the constant exposure to cold. Recognizing this the sailors' union about a year ago undertook to examine crews in active service for tuberculosis. About 18,000 examinations have been completed. Hereafter sailors will no longer be employed on German ships without certificates of examination. No charges are made to sailors for these tests.

Professor Riecke's Seventieth Birthday

Prof. Erhard Riecke, dermatologist, completed his seventieth year May 11. He had been full professor since 1920 in the department of dermatology and venereology in Göttingen and recently retired on reaching the retiring age. Riecke made a reputation by the publication of a textbook on cutaneous and venereal diseases, a book that enjoyed numerous editions and is the most widely used German textbook in this field.

AUSTRALIA

(From Our Regular Correspondent)

Sept. 1, 1939.

Social Service in New Zealand

The social security scheme in New Zealand this year will cost £12,000,000, distributed over a population of only one million people. Payments include £6,910,000 in old age benefits, £1,050,000 for invalids, £1,010,000 for widows, £508,000 for sickness benefits, £306,000 for maternity benefits, £738,000 for hospitals, £100,000 for medical expenses and £459,000 for administrative expenses. Of the total cost £5,550,000 will be obtained from wages, £3,050,000 from other income and £2,000,000 from the consolidated fund. The budget has been received with hostility by the business sections of the community. The decision to increase the tax on gasoline by fourpence per gallon and that on beer by sixpence per gallon is particularly unpopular. Prof. A. H. Locker, leading economist, has stated that the budget appears to be mainly a stop gap and that the government is merely deferring the evil day when it will have to face its difficulties.

MATERNITY SERVICES CONTRACTS

After much dissension, the medical profession has now approved by ballot the acceptance of contracts for maternity services, under the social security scheme, and the government has been asked by the profession to legislate to make contracts binding on all practitioners who normally undertake maternity work. The effect will be that all mothers who desire state assistance will have this right, although any who do not wish to take the benefit may make independent arrangements. This decision, however, does not dispose of the larger question, which is still at issue between the British Medical Association and the government over the inauguration of the universal practitioner service. A powerful coercion on the profession may, however, come from the public. Several letters appearing in the press have pointed out that the community is now paying the social security tax but still has to pay for the services of a doctor. The writers suggest that instead of paying for medical

services twice over, as at present, doctors' bills should be ignored in future. If this idea "catches on," the British Medical Association will be forced irrevocably to obey the voice of the people as expressed in a democratic election.

Plumbism and Chronic Nephritis

As long ago as 1892, attention was drawn to the prevalence of lead poisoning among children in Brisbane. It was not until 1929, however, that serious attention was paid to the possible association of plumbism and chronic nephritis. Now the commonwealth department of health has issued a brochure on the subject consisting of a report by Dr. R. Elliott Murray including details of a method for the estimation of lead in biologic materials. At the present time about ninety persons below the age of 30 years and approximately the same number between the ages of 30 and 50 die annually from nephritis in Queensland, in excess of the number that would succumb to the disease were the death rate the same as that of Great Britain. The death rate below the age of 30 years is about the same as it was from 1917 to 1926, but above that age it has been steadily tending to increase. During the same period the annual total death rate from chronic nephritis at all ages has increased from an average of 403.5 to 558 per million of population. Murray has shown beyond doubt that plumbism does occur in children in Queensland. Investigating paint as a source of lead, he found that paint which retained its glossy hard surface would not yield any appreciable amount of lead on being rubbed with saliva moistened fingers. On the other hand, when the paint became weathered the danger rapidly became serious. He makes the observation that a weathered paint containing a low percentage of lead may yield more lead on being rubbed than a paint containing a higher proportion of lead but remaining in a better condition and suggests that the 5 per cent limit to the lead content of paint for veranda railings, gates and fences as enacted in 1923 may still allow dangerous amounts of the material to become available to children after weathering has occurred.

Considering the question whether plumbism is a factor in the causation of chronic nephritis in Queensland, Murray concludes that from a consideration of the past history of cases of nephritis and the later progress of cases of plumbism, together with the results of biochemical examination of nephritis cases, lead poisoning in childhood is a major factor in the causation of the abnormal Queensland incidence of chronic nephritis. Although it would appear possible that it is the sole factor responsible, it cannot be stated dogmatically that such is the case. It would appear probable that any other factor which can cause renal damage could act in conjunction with lead to aggravate the condition. The role of climate with its possible effects on acid-base and mineral metabolism cannot be accurately assessed, but while it may act as an adjuvant to other sources of renal damage there is sufficient evidence to allot to it a major role.

A National Memorial to Sir Truby King

The Royal New Zealand Society for the Health of Women and Children, more commonly known as the Plunket Society, has launched an appeal for a national memorial to its founder, the late Sir Truby King. Such an appeal has the whole-hearted support of the medical profession in New Zealand. It has been decided that £2,000 of the sum obtained shall be set aside to assist in the upkeep and maintenance of the home of Sir Truby King in Wellington, which he bequeathed to the society. A further £2,500 will be invested for the purpose of providing a postgraduate course for nurses trained in the Plunket system of child welfare, while smaller sums will be expended on a monument and a portrait of the founder of the Plunket Society.

It is too soon after the death of Sir Truby King to assess finally and with any accuracy his contribution to medical science. We can, however, pay homage to his personal attributes. His untiring energy and selfless devotion to an ideal were known all over the world. He possessed a genius for organization of a high order, and to a remarkable degree he wielded the power of infusing others with his own enthusiasm. He was held in great honor by members of his profession, and their response to the appeal made by the council of the Plunket Society no doubt will be spontaneous.

Medical School for Queensland

The official opening of the new medical school of the University of Queensland on August 11 marks the final achievement in the campaign for the provision of facilities for medical education in this state. When in October 1936 the Faculty of Medicine was inaugurated, that function marked the successful issue of representations which had their commencement as early as the foundation of the university itself. The first actual proposals in 1913 were interrupted by the outbreak of the great war and shortly after its conclusion in 1922 arrangements were made for anatomic demonstrations to be given to certain of the dental students at the university. By slow degrees from this small beginning grew the skeleton structure of a medical course. In 1936 it was suggested that the inauguration of the faculty was of such importance that even makeshift provision, so far as buildings were concerned, would be better than delay, but the government after due consideration decided to provide buildings worthy of the new venture, and the recently completed medical school is a magnificient tribute to their recognition of its scope and importance. The building is a dignified example of Renaissance architecture and has been designed to incorporate all modern improvements in laboratory and lecture room design.

COPENHAGEN

(From a Special Correspondent)

Sept. 19, 1939.

The Hospital Habit

A generation or two ago it was the rule rather than the exception for residents of Copenhagen to be sick at home. Now most of them, when seriously ill, prefer hospital to home treatment. Support of these remarks is to be found in a study Dr. Povl Heiberg has undertaken with the object of showing how the hospital habits of his fellow countrymen have changed. He has studied his material in five year instead of one year periods to avoid the pitfalls inherent in small figures. In the five year period 1881-1885 only 29 per cent of all the deaths in Copenhagen occurred in hospitals, whereas the corresponding figure for the five year period 1931-1935 was 67 per cent. At the end of the last century only one in every three of the population of Copenhagen died in a hospital, whereas now two in every three do so.

This remarkable change has not been effected in an equal degree by the various diseases responsible for the deaths on record. Hospital treatment for such a disease as croupous pneumonia, for example, is not so much more common now than it was in the five year period 1886-1890, when 26 per cent of all the cases were admitted to a hospital. The corresponding figure for the five year period 1931-1935 was 37 per cent. On the other hand, only 28 per cent of all the deaths from pulmonary tuberculosis between 1896 and 1900 occurred in hospitals, whereas between 1931 and 1935 as great a proportion as 75 per cent did so. Indeed, in the case of syphilis and gonorrhea the tendency seems to be away from inpatient hospital treatment in favor of outpatient hospital treatment. Formerly, every fifth case of scabies was treated in hospitals, whereas now, thanks in large part to the quick efficiency of modern treatment, it is found necessary to provide hospital treatment for only some 3 per cent of these cases. This is just as well, for there are still some 5,000 to 6,000 cases of scabies notified in Copenhagen every year in spite of the compulsory treatment provided for this disease.

Denmark's Dietetic Habits

Dr. Johanne Christiansen, who seems to have become the uneasy dietetic conscience of her country, continues to wage war on her fellow countrymen's sins of omission and commission over the dinner table. Her special aversion is Dr. Hindhede, who did so much a generation ago to promote vegetarianism in Denmark. The duel between these two protagonists has been carried on outside as well as inside Denmark, and in 1934 Dr. Christiansen issued in a German medical journal a pugnacious article with the ominous heading Mein Kampf gegen Hindhede. This autumn she has issued in Danish a fairly comprehensive summary of the faith which is in her. The Danes, she says, are laboring under the most embarrassing handicap of utterly misguided doctrines concerning the very elements of nutrition. They are fed on margarine, bacon, refined sugar and sophisticated flour, whereas what they need in the place of these mischief-making foods are milk, eggs, cheese, meat, fish, fruit, vegetables and wholemeal bread. The Danes in the Middle Ages lacked vitamin C and, before the introduction of potatoes, were subject to scurvy. The Danes of today suffer from a host of ills because natural and protective foods have largely been replaced by artificial foods from factories. As a race, Danes are far too plump, and it is no mere chance that in some Danish hospitals about 10 per cent of all the diagnoses on admission are obesity. It is temptingly easy for the medical profession to cope with this situation by prescribing various vitamin preparations with a view to repairing the mistakes of the menu, but how much more rational it would be to revise the menu and thus to make proprietary vitamin preparations superfluous! When a Dane falls ill, it has heretofore been the practice in hospital dietaries to reduce rather than increase his supply of vitamins, and he has been fed on pappy foods instead of on plenty of milk and on meat soups, which are an excellent vehicle for vegetables. Dr. Christiansen would also like to see her countrymen producing home-brewed beer containing plenty of vitamins B and C. The old Danish custom of mixing home-brewed beer with milk might well, she says, be revived.

Vitamin K Deficiency in Infancy

A good example of effective team work in Copenhagen is to be found in the hospital for children's diseases under Professor Bloch, the University Biochemical Institute under Professor Ege, and the obstetric departments A and B of the Rigshospital under Professor Hauch and Professor Rydberg respectively. The coordinators of this work are Drs. Dam, Tage-Hansen and Plum. Employing the technic elaborated by Dam and Glavind for the quantitative demonstration of prothrombin in the blood, they have succeeded in linking up in a clinical triad the following conditions heretofore regarded as independent of one another: icterus gravis neonatorum, anaemia neonatorum and hydrops congenitus. The connecting link, demonstrable in each case, is a well defined hypoprothrombinemia. Administration of vitamin K to the patients suffering from these conditions was so effective in rapidly raising the quantity of prothrombin in the blood that it seemed likely that these patients must have been suffering from vitamin K deficiency.

Last April a 26 day old boy was admitted to Professor Bloch's hospital suffering from jaundice, anemia and hemorrhages. Vitamin K deficiency being suspected, the rate of coagulation of the blood was investigated, the content of prothrombin in the blood being measured. It proved to be much reduced, and the child was therefore treated with vitamin K. Within a day of this treatment the hemorrhages ceased. This striking observation led to quantitative analyses of prothrombin in the blood of healthy children and others suffering from such conditions as icterus gravis neonatorum, anaemia neonatorum and congenital hydrops. The conclusion drawn from these studies is that under normal conditions there is a shortage of vitamin K during the first few days after birth. No depot of vitamin K existing in the baby's body at birth, and the supply of this vitamin depending on the mother's milk and bacterial activity in the intestine, this temporary shortage of vitamin K is inevitable and is repaired only after the baby has begun to feed and the normal bacterial activities of the contents of the intestines have set in.

BUCHAREST

(From Our Regular Correspondent)

Aug. 18, 1939.

More Than a Thousand Centenarians in Rumania

The Central Statistical Institute, led by Prof. D. Sabin Manuila, has published a bulky volume with the title "Breviarul Statistic al Romaniei." According to this book the number of persons in the kingdom reached in this year the figure of 19,535,398. Of these about 80 per cent, that is 15,926,178, live in villages and the number of the urban population is only 3,609,220. The number of children under 9 years of age is 4,822,698 and of persons from 70 to 80 is 323,355, from 80 to 90 is 61,212 and from 90 to 100 is 8,030. The number of persons over 100 years of age is 1,074. Since the last census in 1930 the birth rate has fallen from 35.2 per thousand to 31.5 per thousand. The death rate, however, did not follow the rate of decrease of the birth rate, decreasing only from 21.2 to 19.8.

Marriages

Henry Franz Albrecht Jr., Troy, N. Y., to Miss Catherine Elizabeth McArdle of Lawrence, Mass., recently.

James D. Sory, Madisonville, Ky., to Mrs. Margaret Johnson of Boston at Lexington, Ky., September 16.

Watson Wharton, Smithfield, N. C., to Miss Eddythe Hawkins of Johnson City, Tenn., August 17.

Charles McCaw Wood to Miss Florence Swan, both of Maroa, Ill., at Rochester, Minn., August 15.

Samuel A. Alessandra, Dallas, Texas, to Miss Ethel Evelyn Prince of Timpson, September 1.

Ivan Vincent Bamberger, York Haven, Pa., to Miss Myre E. Painter of York, September 20.

Edward Kirby Lawson, Penbrook, Pa., to Miss Bessie B. Stoner of Philadelphia, August 4.

Ernest E. Wiesner, Brockton, Mass., to Miss Doris Billings of Lynn, September 8.

Alban Papineau, Plymouth, N. C., to Miss Jeannette Edwards of Ayden, August 30.

Edwin E. McNiel to Miss Marjorie Robertson, both of Honolulu, Hawaii, July 16.

Ellwood W. Godfrey, Ambler, Pa., to Miss Sophia Moore of Wynnewood, August 28.

William N. Gilman, Wenona, Ill., to Miss Dorris Louise Lee of Normal in August.

Grant Sanger to Miss Margery Edwina Campbell, both of New York, September 30.

Alfred A. Gellhorn, St. Louis, to Miss Olga Frederick of Nokomis, Ill., August 4.

Joseph Marcovitch, Dwight, Ill., to Miss Lillian Ganzer at Brooklyn, September 6.

Walter J. Phillips, Chicago, to Miss Helen Petkus of Cicero, Ill., August 20.

Joseph N. Rose, Evarts, Ky., to Miss Myrtle A. Kennedy of Harlan, recently.

Nathan R. Abrams to Miss Edna Silverstein, both of Cincinnati, August 20.

Hans Syz to Miss Emily Sherwood Burrow, both of New York, August 12.

Joel Wright to Miss Onie May, both of Alpine, Texas, August 6.

Deaths

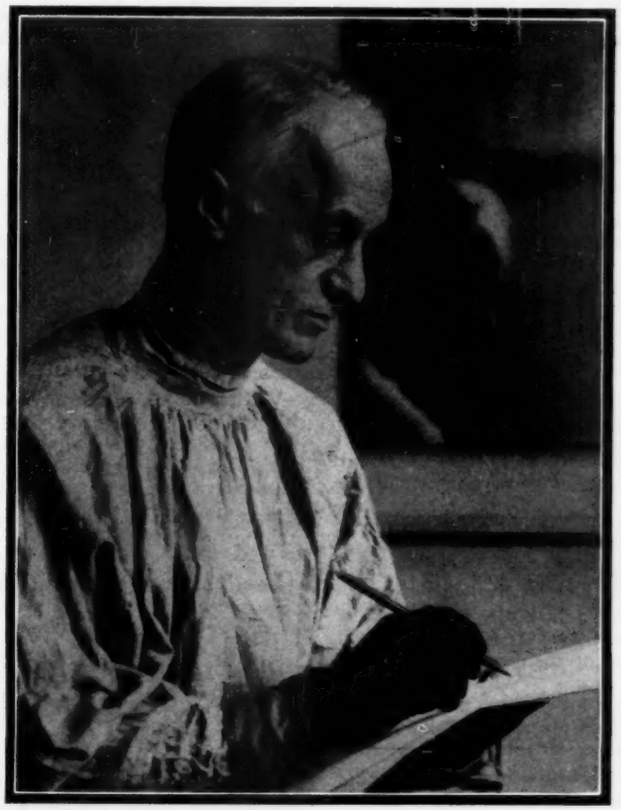
Harvey Cushing ✠ most distinguished of all surgeons in operative procedures on the brain, recognized as an accomplished author, educator, philosopher and leader, died in New Haven, Conn., Saturday, October 7, of coronary thrombosis. He was the fourth Cushing in a direct line to win distinction in a medical career.

Dr. Harvey Cushing was born in Cleveland, April 8, 1869, the ninth child in his family. His well known brother, Edward F. Cushing, M.D., a pediatrician, died in 1911; his father, Henry K. Cushing, formerly professor of obstetrics and gynecology in Western Reserve University School of Medicine, died in 1910; his grandfather Erastus Cushing died in 1893, and his great grandfather David Cushing Jr., of Massachusetts, died in 1840.

After receiving the bachelor of arts degree at Yale in 1891, where incidentally he also played baseball, Dr. Harvey Cushing graduated from Harvard Medical School in 1895, receiving the degrees of master of arts and doctor of medicine. He entered the Massachusetts General Hospital as surgical intern, working with Dr. J. C. Warren. In 1896 he went to Baltimore as junior assistant in the surgical service of Halsted, becoming resident surgeon in 1897 and developing as instructor in surgery, assistant in surgery and associate in surgery. He made the first roentgenograms that were made at Johns Hopkins Hospital and did experimental studies on gallstones, the bacteriology of the alimentary canal, and cocaine anesthesia. In 1900 he studied abroad, traveling with Drs. William Osler and Thomas McCrae. On this trip Dr. Cushing studied in England, France and for a year in Kronecker's laboratory in Berne. Here he carried out some investigations suggested by Kocher on the physiologic relationships of intracranial tension. This work he continued in the laboratory of Mosso in Turin, Italy, and then for four months he worked with Sherrington in Liverpool studying the motor cortex in anthropoids. Late in 1901 he returned to Baltimore and asked for the post of neurosurgeon in the clinic. Here he remained until 1912, during which time he became associate professor of surgery. He gave the Mutter lecture in Philadelphia in 1901. He became a member of the American Neurological Association in 1903 and president in 1923, a charter member of the American Society of Clinical Surgery in 1903 and president in 1921, a member of the American Physiological Society in 1905, a fellow of the American Surgical Association in 1906 and president in 1927. Dr. Cushing was secretary of the Section on Surgery and Anatomy of the American Medical Association in 1906-1907. He gave the Carpenter lecture in New York in 1906 and the W. M. Banks Memorial lecture in Liverpool in 1909 and the Harvey lecture in New York in 1910. During this period he developed his marvelous technic in neurosurgery. The earlier operations were failures, but Dr. Cushing's courage, precise technic and remarkable spirit began to yield success and his fame spread widely. During this period he developed and described the subtemporal decompressive operation and perfected hemostasis in operations on the brain and new technics for suture. His contributions to the physiology of the brain, the spinal fluid and the pituitary body were fundamental.

In 1912 Dr. Cushing became Moseley Professor of Surgery at Harvard and Surgeon-in-Chief to the Peter Bent Brigham Hospital. He received the master of arts from Yale in 1913, gave the oration of surgery at the International Congress of Medicine in London in 1913 and was made a fellow of the Royal College of Surgeons, of the American College of Surgeons of which he became president in 1922 and of the Institute of Hygiene in London. He gave the Weir Mitchell lecture in Philadelphia in 1914 and was elected at that time a foreign member of the Société de neurologie in Paris, of the American Academy of Arts and Sciences and of the Washington Society of Arts and Sciences.

In 1914 came the great war, during which the remarkable service rendered by Harvey Cushing was universally recognized. He served with distinction in the British Expeditionary Force; he became surgical director of the United States Base Hospital No. 5 and was appointed senior consultant of neurologic surgery with the American Expeditionary Forces with the rank of colonel. For these services he received the Distinguished Service Medal of the United States, the Companion of the Bath of England, and Officer of the Legion of Honor of France. His war service is reflected in his recently published "Diary of a War Surgeon." Evidently this service in the war was a terrific physical stress, for Dr. Cushing returned to Boston in 1919 suffering from peripheral neuritis, which was to handicap him during the remainder of his career. Nevertheless in the years from 1919 on he worked indefatigably. He turned to an interest in the history of medicine and made a complete collection of the writings of Vesalius. At the same time he developed a surgical team for neurologic surgery and himself studied intimately the microscopic anatomy, gross anatomy, pathology and physiology of conditions within the brain. Young surgeons flocked to him from all over the world. Today his pupils have won distinction as neurosurgeons. In 1918 he became fellow of the Royal College of Surgeons of Ireland. He received the degree of doctor of science from Washington University in 1919 and in the same year the honorary doctor of laws from Western Reserve University, doctor of science from Yale and Doctor of Science of Queen's University, Belfast. In 1920 he received the degree of honorary doctor of laws from Cambridge and in 1921 was made honorary fellow of the Medical Society of London, giving the chief oration in 1927. In 1921 he became a corresponding member of the Medical Society of Vienna and in 1922 a Charles Mickle Fellow of the University of Toronto, also the Cavendish Lecturer (London) and was awarded the title of Honorary Perpetual Student of St. Bartholomew's Hospital, London. He also became a corresponding member of the Medico-Chirurgical Society of Edinburgh.



HARVEY CUSHING, M.D., 1869-1939

After the death of Sir William Osler, Lady Osler turned over all her data relative to her distinguished husband to Harvey Cushing and he took up the task of preparing the famous biography. This book appeared in 1925 in two large volumes and was awarded the Pulitzer Prize as the best biographic writing of the year.

In the meantime he continued his surgical operations and received additional honors. In 1923 he became a foreign member of the Académie de médecine of Paris and a fellow of the Association of Surgeons of Great Britain and Ireland. In 1924 he gave the Cameron Prize Lecture at Edinburgh and was elected a corresponding member of the Società medico-chirurgica di Bologna. In 1926 he received the honorary doctor of laws from the University of Glasgow, in 1928 the doctor of laws from Jefferson Medical College and the Doctor of Medicine from John Casimer University of Lwow, Poland. In the following year he was made honorary fellow of the Royal Society of Medicine of England, of the Royal Academy of Medicine of Ireland, master of surgery of Trinity College, London, doctor of laws

of the University of Edinburgh and a fellow of the Royal College of Surgeons of Edinburgh. In 1929 there was published in his honor a special number of the *Archives of Surgery,* dedicated to his sixtieth birthday. A similar festschrift was later published by *Acta medica Scandinavica.* In 1932 Dr. Cushing retired from his posts in Boston and became Sterling professor in the School of Medicine of Yale University, teaching neurology and the history of medicine and holding this position until 1937, when he became emeritus professor.

In addition to the famous "Life of Sir William Osler," Dr. Cushing published "The Pituitary Body and Its Disorders" in 1912, "Tumors of the Nervous Acusticus" in 1917, with Dr. Percival Bailey "A Classification of the Gliomata" in 1925, collected essays under the title "Consecratio Medici" in 1928, "Intracranial Tumors" in 1932, and in the same year a book on "The Pituitary Body and the Hypothalamus."

In July 1938 Oxford University conferred on him the honorary degree of doctor of science, on which occasion great physicians and surgeons from all over the world assembled to honor him. It was pointed out that his former pupils hold positions in Brussels, Louvain, Amsterdam, Manchester, Edinburgh, Leeds, London, Oxford and Newcastle-on-Tyne as well as in most of the leading clinics in the United States. There are honorary Cushing clubs in many medical schools dedicated to his work and his memory.

Since 1931 great universities have continued to honor him. He gave other lectures, such as the Donald Balfour Lecture of the University of Toronto. In 1933 he was honored in Paris, at which time he was presented with the original copy of Clemanceau's thesis for the doctorate in medicine, written in 1865. He received also the honorary degree of doctor of laws from Northwestern University and the honorary degree of doctor of medicine from Budapest.

Of recent years Dr. Cushing had shown special interest in maintaining the traditional professional status of the physician and surgeon and he had given freely of his time and of his efforts in this endeavor. An essay called "Medicine at the Crossroads," published in THE JOURNAL, May 20, 1933, page 1567, defined his point of view. In this essay he wrote: "Those who deal with the science of society deal with something that actually does pulsate with so short a time cycle that conditions almost from year to year are never quite the same, so that our theories of today are likely to need modifying tomorrow. What this puzzled world needs perhaps is more study of the past, fewer commissions and surveys of the present, and a greater number of philosophically minded, self-supporting and law-abiding persons who can see all round their particular problem and independently devote themselves to it as do most doctors."

In the presence of such a record and such a career, in the light of such a character and such a man, superlatives fail. Great epochs in medicine are marked by the names of physicians whose careers have made these epochs. With Dr. Harvey Cushing, surgery of the brain became for the first time scientifically established. Of him it may be truly said that he was in all that he attempted greatest of the great.

Andrew Stewart Lobingier, Los Angeles; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1889; member and past president of the Pacific Coast Surgical Association; fellow of the American College of Surgeons; formerly on the staffs of the Hospital of the Good Samaritan and the Hollywood Clara Barton Memorial Hospital; at one time lecturer in surgery at the University of Southern California School of Medicine; professor of bacteriology and pathology, Gross Medical College, Denver, 1889-1892; professor of pathology, University of Colorado School of Medicine, Denver, 1892-1894, and professor of surgery, 1894-1902; formerly secretary of the Colorado State Medical Society; aged 76; died, July 31, of arteriosclerosis.

Herbert Peter Howell Galloway, Winnipeg, Man., Canada; Victoria University Medical Department, Coburg, Ont., Canada, 1887; formerly associate professor of clinical surgery (orthopedic), University of Manitoba Faculty of Medicine; served during the World War; served as president of the Manitoba Medical Association and the Winnipeg Medical Society; member of the Clinical Orthopedic Society and the American Academy of Orthopedic Surgery; past president and vice president of the American Orthopedic Association; fellow of the American College of Surgeons; aged 73; was the original orthopedic surgeon at the Children's Hospital; on the staff of the Winnipeg General Hospital, where he died, July 13, of cerebral hemorrhage.

George Samuel Bel ✠ New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1893; professor of medicine at the Louisiana State University Medical Center; assistant in medicine, 1894-1900, instructor in medicine, 1900-1904, assistant professor of medicine, 1904-1910, professor of clinical medicine, 1910-1918, professor and head of the department of medicine, 1918-1924, and emeritus professor of medicine at his alma mater; president of the Louisiana State Board of Medical Examiners; past president of the Louisiana State Medical Society; director of the Charity Hospital; aged 67; died, August 10, of coronary thrombosis.

Lena Kellogg Sadler ✠ Chicago; American Medical Missionary College, Chicago, 1906; fellow of the American College of Surgeons; past president of the Medical Women's National Association and the Chicago Council of Medical Women; attending gynecologist to the Columbus Hospital; attending surgeon to the Women and Children's Hospital; author of "How to Feed the Baby" published in 1925, author with Dr. W. S. Sadler "The Mother and Her Child" published in 1916 and "Psychiatric Nursing" published in 1937, and other books; aged 64; died, August 8, of carcinoma of the breast.

Milton Arlanden Bridges ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1919; assistant professor of clinical medicine at the New York Post-Graduate Medical School, Columbia University; fellow of the American College of Physicians; served in various capacities on the staff of the Riker's Island Hospital of the Department of Correction; consulting physician to the Sea View Hospital, Staten Island; author of "Dietetics for the Clinician" and "Food and Beverage Analyses"; aged 45; died, August 19, of chorio-epithelioma.

George Hudson McLellan ✠ Lieutenant Colonel, U. S. Army, retired, San Diego, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1907; was commissioned in the medical corps of the U. S. Army as a first lieutenant in 1909 and retired as a major in 1922 for disability in line of duty; served during the World War; was appointed lieutenant colonel under the special act of June 21, 1930; aged 55; died, July 14, of coronary occlusion and cerebral hemorrhage.

William Louis Clapper, St. Louis; Washington University School of Medicine, St. Louis, 1904; formerly senior instructor in obstetrics, gynecology and abdominal surgery, St. Louis University School of Medicine; on the staff of St. Luke's Hospital; assistant gynecologist and obstetrician to St. Mary's Group of Hospitals; member of the Missouri State Medical Association; fellow of the American College of Surgeons; aged 61; died, August 4, of Parkinson's disease.

Leo Thomas Perrault, New York; Jefferson Medical College of Philadelphia, 1908; associate professor of clinical otolaryngology at the New York Post-Graduate Medical School, Columbia University; member of the Medical Society of the State of New York; on the staffs of St. Luke's Hospital, St. Francis Hospital, Post-Graduate Hospital and Metropolitan Hospital; aged 55; died, August 25, in Mantoloking, N. J., of coronary thrombosis.

Bernhard Friedlaender ✠ Detroit; Baltimore Medical College, 1898; member of the Radiological Society of North America; formerly attending obstetrician and gynecologist at the Women's Hospital, and senior surgeon at the Highland Park (Mich.) Hospital; aged 68; died, August 14, in Rochester, Minn., of thrombosis of the mesenteric vein, gangrene of the intestine and peritonitis.

Clyde I. Allen ✠ Detroit; Johns Hopkins University School of Medicine, Baltimore, 1921; fellow of the American College of Surgeons; member of the American Association for Thoracic Surgery; for many years on the staff of the Henry Ford Hospital; aged 45; died, August 2, of cerebral hemorrhage, arteriosclerosis and hypertension.

Joseph Dixon Purvis ✠ Butler, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1908; past president of the Butler County Medical Society; on the staff of the Butler County Memorial Hospital; aged 56; died, August 3, in St. Mary's Hospital, Rochester, Minn., of subarachnoid hemorrhage.

Judson Albert Palmer, Arcadia, Wis.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1890; member of the State Medical Society of Wisconsin; served during the World War; formerly mayor, bank president and health officer; aged 70; died, July 7, of heart disease.

Carl O. Hertzman, Ashland, Wis.; College of Physicians and Surgeons, Baltimore, 1900; member of the State Medical Society of Wisconsin; city health officer; aged 72; on the staffs of St. Joseph's Hospital and the Ashland General Hospital, where he died, July 25, of chronic nephritis and uremia.

Carroll J. Tucker, San Diego, Calif.; Indiana University School of Medicine, Indianapolis, 1914; served during the World War; aged 52; died, July 18, in the Veterans Administration Facility, West Los Angeles, of carcinoma of the prostate with multiple metastases.

Edwin Jason Brewer, Shabbona, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; member of the Illinois State Medical Society; for many years mayor; aged 64; died, August 6.

Ira Ayer, San Diego, Calif.; Long Island College Hospital, Brooklyn, 1892; veteran of the Spanish-American War; at one time personal physician to the King of Siam; aged 70; died, July 9, in the United States Naval Hospital, of myocarditis.

Truman Osborne Boyd ⊕ Long Beach, Calif.; University of Louisville (Ky.) Medical Department, 1902; past president of the Idaho State Medical Association; aged 69; on the staff of St. Mary's Hospital, where he died, July 8, of lymphosarcoma.

Edmund Francis Fusco ⊕ Elizabeth, N. J.; Columbia University College of Physicians and Surgeons, New York, 1934; member of the Medical Society of the State of New York; aged 29; died, July 23, at St. Elizabeth Hospital.

Thomas Francis Gartland ⊕ White River Junction, Vt.; University of Vermont College of Medicine, Burlington, 1893; aged 70; died, July 7, at the Mary Hitchcock Memorial Hospital, Hanover, N. H., of coronary occlusion.

Philips Josiah Edson ⊕ Pasadena, Calif.; University of California Medical School, San Francisco, 1924; on the staffs of St. Luke's Hospital and the Huntington Memorial Hospital; aged 42; died, July 6, in San Marino.

Gustave Adolph Fritz, Baltimore; University of Maryland School of Medicine, Baltimore, 1915; member of the Medical and Chirurgical Faculty of Maryland; formerly coroner; aged 48; died, July 9, of heart disease.

John Walter Fitz-Gerald ⊕ Buffalo; Trinity Medical College, Toronto, Ont., Canada, 1900; aged 67; died, July 12, at his summer home at Wasaga Beach, Ont., of coronary thrombosis.

Edgar August Degenhardt ⊕ Chicago; Chicago Medical School, 1921; served during the World War; aged 43; died, August 14, at his home in Oak Park, Ill., of coronary thrombosis.

Oliver H. Thompson, Marion, La.; University of Nashville (Tenn.) Medical Department, 1884; formerly bank president and member of the school board; aged 82; died, July 28.

Charles W. Montgomery, Washington, D. C.; National Homeopathic Medical College, Washington, D. C., 1894; aged 71; died, July 11, of cerebral hemorrhage and arteriosclerosis.

Ephraim Gardner Kimball, Washington, D. C.; Columbian University Medical Department, Washington, D. C., 1888; aged 81; died, July 17, of chronic nephritis and pyelitis.

Ira De La Matter, Long Branch, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1911; aged 56; died, August 3, in the Toronto Western Hospital.

Laurence A. Saunders, Los Angeles; Louisville (Ky.) Medical College, 1876; aged 85; died, July 24, of pulmonary tuberculosis.

Colston L. Dine, Minster, Ohio; Medical College of Ohio, Cincinnati, 1886; aged 81; died, August 1, of cerebral arteriosclerosis.

William John Hunter Emery, Porterville, Calif.; Cleveland University of Medicine and Surgery, 1882; aged 78; died, July 31.

Henry Applegate Lacy ⊕ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1891; aged 75; died, July 30.

Loyal Low Liken, Smithmill, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1901; aged 69; died, July 2.

Robert H. McLean, Lillington, N. C. (licensed in North Carolina in 1882); aged 86; died, July 14, of myocarditis.

Walter J. Proper, Pleasantville, Pa.; Starling Medical College, Columbus, Ohio, 1883; aged 79; died, July 20.

Robert Herman Dengler, Philadelphia; Jefferson Medical College of Philadelphia, 1887; aged 79; died, July 19.

CORRECTION

Dr. Fisher Not Dead.—Dr. James Coleman Fisher of Jefferson, Ohio, whose death was reported in THE JOURNAL September 30, page 1346, is not dead. His death was erroneously reported by the Decatur (Ill.) *Herald-Review*, August 6.

Correspondence

POTASSIUM CHLORIDE IN ALLERGY

To the Editor:—In THE JOURNAL, September 2, appeared a communication by Dr. David Louis Engelsher in criticism of my report on potassium chloride in allergy. Since this might give an erroneous impression, both of the toxicity and of the efficacy of potassium chloride, I feel that some clarification is needed.

Dr. Engelsher has made the simple mistake, against which I warned in my article, of administering potassium chloride in the dry form. He says "The patients were given ten 5 grain (0.3 Gm.) tablets of potassium chloride to be taken, when necessary, three times a day after meals with at least one glassful of water." (By this he probably means 5 grains to a dose rather than 50.) In my article I stressed the necessity for administering it in dilute form, e. g., 5 grains dissolved in a glass of water. This does not mean prescribing a 5 grain tablet to be taken with a glass of water. It is apparent that the severe epigastric pain described by Dr. Engelsher is due, as I have already noted, to his method of administration. Unfortunately, many of the drug houses are now marketing potassium chloride in tablet form without clear instructions that the tablet is to be dissolved before being taken. When properly administered, potassium chloride only rarely produces side effects. The most important of these is the occasional aggravation of asthma, which calls for the immediate cessation of this treatment; other rare effects include diarrhea and urinary urgency. I have not advocated the use of potassium chloride in chronic asthma.

Answers to letters sent to a number of leading physicians in this country indicate a wide divergence of opinion with regard to its efficacy in allergy. Many report gratifying results, particularly in hay fever and allergic rhinitis. On the other hand, many have found it so far completely ineffective. My results continue to be good, although I do have failures. The only published report so far is that of A. F. Abt, who obtained excellent results in twenty cases. I hope that an explanation for this sharp discrepancy of opinion will be forthcoming. Potassium is neither a "cure" nor a "cure-all"; it is apparent, however, from my results as well as from the numerous reports which I have received, that it has given appreciable relief to a large number of allergic patients.

BENSON BLOOM, M.D., Tucson, Ariz.

THE DEGREE OF "DOCTOR" IN DENTISTRY

To the Editor:—The need for safeguarding the title of "doctor" in the interest of public protection and professional dignity was clearly pointed out by Dr. Frederick Juchhoff in his communication "The Degree of Doctor," published in THE JOURNAL August 26, page 876. I need add little to support the main thesis. Although I fully approve the spirit of the communication, I wish to recommend a modification of the following statement by the author to give it a sense of greater completeness: "The statutes should prohibit the use of the title doctor in connection with any healing art by one who does not have a regular medical training." By addition of the phrase "and dental training" following "medical training," the dental profession will be given the honor of distinction that American dentistry rightly deserves. As an Associate Fellow, I believe that I express the sentiment of other dental members in the Association.

From observations made in my recent study on dentistry and dental education (Principles Underlying the Social and Professional Background in the Education of Dentists and Teachers of Dentistry, thesis, New York University, School

of Education, June 7, 1939) it is noted that in 1940 all dental schools in the United States will require a two year preprofessional course and a four year professional course of training for the practice of dentistry and the degree of Doctor of Dental Surgery (D.D.S. or D.M.D.). The years required for the professional training of the dentist are the same in number as those required of the physician. As indicated by Dr. Fishbein, the medical course in the United States covers four years (Fishbein, Morris: Do You Want to Become a Doctor? New York, Frederick A. Stokes Company, 1939, p. 37). The two preclinical years of the four year professional course in dentistry include a considerable portion of subject matter that is identical in content with the first two years of the medical course. In addition to this, almost all dental schools are affiliated with universities. Since the publication of Professor Gies's Carnegie study in 1926 the proprietary dental school of the past has disappeared in the United States.

It is true, as shown in my report, that a large percentage of dentists and dental educators favor maintaining dentistry as an autonomous profession, independent of medical education. It is, however, unanimously conceded that dentistry is a specialty of medicine (not of medical practice) and an acknowledged oral health service. Dentistry has attained a place of scientific recognition to the extent that eleven dentists have considered it worth while to pursue their graduate studies leading to the Ph.D. degree in hygiene, chemistry and surgery. It has been my pleasure to take the Ph.D. degree in education, stressing in the thesis the professional and social significance of dental education.

I suggest that in all considerations of the degree of "doctor," dentistry be given its due recognition and the consideration it deserves. After all is said and done, dentistry is an integral part of the medical profession. It therefore behooves those who write in defense of the title "doctor" not to overlook the honorable degree of doctor in dentistry.

ALFRED J. ASGIS, D.D.S., PH.D., New York.

VULVOVAGINITIS IN PREGNANCY

To the Editor:—"The Significance of Vulvovaginitis in Pregnancy" by Edward G. Waters and Eakle W. Cartwright (THE JOURNAL, July 1, p. 30) does not cover the entire subject; certain points deserve elaboration:

1. Many, if not most, researches of recent date have used Sabouraud's or modified Sabouraud's medium directly for isolation of the yeastlike fungi instead of the method employed by these authors. Their technics might explain this low incidence. Surely those interested in this work would appreciate the authority for the technic advocated in this article. Yeastlike fungi were isolated from 32 per cent of gravid women without vulval symptoms by Plass and his co-workers (*Am. J. Obst. & Gynec.* **21**:320 [March] 1931), from 23 per cent of all pregnant women by Weinstein and Wickerham (*Yale J. Biol. & Med.* **10**:553 [July] 1938) and from 14 to 41 per cent in different economic and hygienic groups by Woodruff and Hesseltine (*Am. J. Obst. & Gynec.* **36**:467 [Sept.] 1938).

2. The relationship of p_H readings to the mycosis is not clear, since these yeastlike organisms will grow in vitro over p_H ranges greater than any reported readings of the vagina (Hesseltine, H. C., and Noonan, W. J.: *J. Lab. & Clin. Med.* **21**:281 [Dec.] 1935).

3. The reports of Hesseltine, Borts and Plass (*Am. J. Obst. & Gynec.* **27**:112 [Jan.] 1934), Bland, Rakoff and Pincus (*Arch. Dermat. & Syph.* **36**:760 [Oct.] 1937) and Karnaky all agree that certain strains of monilia are capable of producing in certain patients the clinical entity vaginal moniliasis. These workers fulfilled Koch's postulate. Moreover, there is good evidence that some women may be carriers without having the clinical state develop, while in others moniliasis may develop when the environment is favorable. Thus, this organism is an opportunist. So, until equally good evidence refuting these observations is forthcoming, these reports would seem to stand.

4. It is assumed that the authors made these vaginal cultures at or near term. Published reports of larger series of oral thrush and vaginal mycosis are in direct disagreement, indicating that with larger series the experimental errors are reduced appreciably. The authors offer no source for the contaminations. It is acknowledged that not all oral thrush is contracted from the mother's genital tract, yet it is well established that this is the most frequent source.

5. Why credit the lochial flow as a fungicidal agent when biopsy studies demonstrate a marked and rapid depletion of the glycogen-like material in the vaginal epithelium immediately after delivery (a state unassociated with vaginal mycosis). Early in studies by other workers it was stated that alkalinity of the lochial flow influenced the course of the mycosis, but now enough available data and confirmatory reports offer, if not establish, a more correct answer, namely a deficiency of nutritive materials. H. CLOSE HESSELTINE, M.D., Chicago.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

APPEARANCE OF THROAT IN INFLUENZA

***To the Editor:*—My associate, who has been practicing thirty years, claims to be able to diagnose grip, or influenza, by means of a pathognomonic throat sign, namely, the appearance of a sharply demarcated, kidney-shaped area of redness confined to the anterior pillars of the fauces with its convexity facing the last lower molar tooth. I have consulted the literature and other physicians on this subject, together with making my own observations, and am unable to confirm this sign, as such a redness appears apparently in many normal throats, especially in smokers. Also the physician claims to be able to prognosticate the course of the disease by means of the gradual fading of this circumscribed redness. He states also that this sign will appear in contacts before the onset of temperature elevation. The rest of the pharynx is allegedly not injected. Is there anything in the literature confirming or denying this sign?**

M.D., New York.

ANSWER.—There is no convincing evidence to substantiate the idea that the sign described is pathognomonic of influenza. Most observers who have had an opportunity to study a large number of cases of influenza at a given time have recorded a diffuse redness of the pharynx, soft palate and faucial pillars. In addition there is observed a distinct swelling of the lymphoid follicles resembling discrete glistening dewdrop nodules on the uvula and soft palate. There is frequently a glazing of mucus over the posterior pharyngeal wall, with an enlargement of lymphoid follicles in this location as well. This general description has been termed characteristic, but to say that it is absolutely diagnostic would be exceeding the facts.

RIGOR MORTIS

***To the Editor:*—Kindly enlighten me regarding cadaveric rigidity. How soon does it set in? How long does it endure before flaccidity occurs? What variations may be expected in warm weather outdoors? What variations may be expected in newborn infants exposed outdoors in warm weather?**

M.D., Missouri.

ANSWER.—Ordinarily rigor mortis starts between three and six hours after death and develops first in the musculature of the head, face and jaws. It then extends to the upper extremities, the trunk and the lower extremities in sequence, and the process becomes complete in about two hours. Its disappearance occurs in from twenty-four to seventy-two hours or more and the progress of the disappearance is usually in the same regular sequence.

Rigor mortis is influenced by a number of conditions and in persons dying of convulsions or after excessive muscular exertion the rigidity appears quickly, often within an hour from the time of death. Generally in powerfully muscled persons

rigor develops slowly and is retained for a long time. In those with poorly developed musculature, as infants and emaciated persons, the rigidity appears rapidly and is lost rapidly. Heat accelerates the onset and speeds its dissolution. Cold also hastens the onset but tends to retard disappearance, so that the stiffness may be retained for days or even weeks. In such cases it may be necessary to distinguish rigor mortis from stiffness attributable to freezing of the body or to mummification.

In a newborn infant, rigor would ordinarily develop quickly and disappear rapidly. At times in these cases the rigor is fleeting and may be overlooked.

From these considerations it is evident that the different stages in the process can rarely be used as definite criteria in determining the time of death. However, if rigor is found only in the head, face and jaw muscles and the body is still warm, it is reasonable to estimate the postmortem interval as between three and six hours. If rigor is found in the torso and arms and not in the legs, death probably occurred less than twelve hours prior to its onset.

If the legs are stiff but not the torso and arms, it is probable that the person has been dead two or three days. In a body found stiff and cold no definite opinion can be expressed as to the postmortem interval. In any event, estimation of the time interval must be made with caution.

SPAS AND MINERAL WATERS

To the Editor:—**Within the past few weeks I have had inquiries from patients as to the value of the spas of Europe and America. 1. Which are the most important ones? 2. What types of diseases do they seem to benefit? 3. Are the springs of America as beneficial as those of Europe? 4. Are all supervised by competent physicians? 5. Do they have dietary regimens, exercises, massages and the like in connection? 6. Where can I obtain information as to the exact chemical analysis of these waters? 7. About how many people frequent these places and what percentage derive some benefit? 8. Can these salts and waters be imported for use in the home? 9. Where can I get a copy of "Spas and Mineral Waters of Europe?" I do not know the names of the authors or publishers, but it was printed in 1896.**

M.D., Minnesota.

ANSWER.—1. Important spas in the United States include Hot Springs, Va.; White Sulphur Springs, W. Va.; Hot Springs, Ark.; French Lick, Ind.; Mount Clemens, Mich.; Excelsior Springs, Mo.; Saratoga Spa, Saratoga Springs, N. Y.; Sharon Springs, N. Y.; Glen Springs, Watkins Glen, N. Y., and a number of others.

In Europe the spas in France include Vichy, Vittel, Aix-les-Bains, Royat and many others. In Germany, Baden-Baden, Wiesbaden, Bad Nauheim, Bad Ems, Carlsbad, Marienbad and Bad Gastein are prominent. In England, Bath, Buxton and Harrogate are important. In each country there are other places where spa therapy can be carried out to good advantage.

2. In general, the use of mineral waters and spa treatment is of some value in chronic disabling conditions, including those affecting the heart and circulation; rheumatic disorders; ailments of the stomach, intestinal tract, gallbladder and liver; nervous conditions; certain disorders of the skin, and some metabolic diseases. It is obvious that not every patient with any of these conditions is a proper subject for spa treatment. The most promising patient is one who does not require bed care, who may be treated as an ambulatory patient and who can take advantage of the many-sided program which is available in a well equipped spa; in fact, the regimen may be more important than the composition of the water.

3. Treatment with mineral waters has the same effect in the United States as in Europe.

4. Competent medical advice is available at practically all spas; the physician referring patients for treatment at a spa should place his patient in the care of one of these physicians, who will outline the program. In most places the spa physician is in private practice. In a few places he is associated with the spa organization.

5. Nearly all places have arrangements for dietary regulation, exercise and massage, the details of which should be outlined completely by the spa physician in charge of the patient's program.

6. "Mineral Waters of the United States and American Spas," by Dr. William Edward Fitch (Philadelphia and New York, Lea & Febiger, 1927), gives the chemical analysis of many mineral waters.

In Europe each country has a publication listing the spas of the country, the nature of their waters and the provisions available for treatment. These may be obtained from their respective travel or publicity bureaus in the large cities such as New York.

7. There are no available statistics regarding the actual number of people taking treatment in the spas of the United States. It is estimated that each year from 40,000 to 50,000 patients take regular treatment at Hot Springs, Ark., and from 12,000 to 15,000 at the Saratoga Spa. These estimates indicate that many people take spa treatment in this country. It is impossible to give the exact percentage of those deriving benefit. Benefit from spa treatment occurs (1) in the specific medical ailment and (2) in the general state of health of the patient. One cannot neglect the psychotherapeutic value of a well organized program of treatment, which, with many patients, goes a long way in building up the morale.

8. Some mineral waters are bottled for home use and can be obtained through the distributing agency of the company handling the waters. The salts of the Carlsbad waters have been imported for years. It must be remembered that the extraction of salts from a mineral water gives a residue which many times cannot be completely dissolved when added to plain water. The artificial duplication of natural mineral waters has not been successful because they practically all contain, in small amounts, a certain number of mineral constituents which are not included in the artificial preparation.

9. There is no recent book in English which gives a general survey of mineral waters and spas. The following references deal particularly with certain phases of this important program:

1. Wallace, A. W.: The Modern Health Resort, THE JOURNAL, Aug. 8, 1936, p. 419.
2. Fantus, Bernard: Our Insufficiently Appreciated American Spas and Health Resorts, THE JOURNAL, Jan. 1, 1938, p. 40.
3. McClellan, W. S.: The Place of Carbon Dioxide Baths in the Treatment of Diseases of the Circulation, *Internat. Clin.* **1**:199 (March) 1937.
4. McClellan, W. S.: The Saratoga Spa: Its Place in the Treatment of Rheumatic Disorders, *Arch. Phys. Therapy* **18**:408-473 (Aug.) 1937.
5. Kovacs, Richard: American Spas, *Hygeia* **17**:207 (March) 1939.

Mineral waters and spa therapy, important as they are, represent only one method of treatment available to the physician, and use of these facilities should be made in conjunction with other methods of treatment such as drugs, dietary regulation and physical measures. Details regarding the chemical and physical properties of the mineral water, the type of accommodations, the cost of treatments and the medical supervision may be obtained by writing to the administration of any of the spas. "Spas and Mineral Waters of Europe" by H. Weber and F. P. Weber was published in London by Smith, Elder and Company in 1896 and 1898. The book is out of print, and no record has been found of the publishing house as being active today.

OPTI-MED AND OBESITY

To the Editor:—**The enclosed abstract and order blank was sent me through the mails from Germany, apparently introducing this new proprietary product called "Opti-Med." Inquiry and a brief search fail to reveal the character of the ingredients. Quite obviously, the reliance on some preparation to hinder or retard intestinal absorption to lose weight would seem hazardous. I should greatly appreciate information concerning the preparation with special reference to the mode of action, dangers and reason—if any—for the inclusion of the ingredients.**

M.D., New York.

ANSWER.—Opti-Med has not been considered by the Council on Pharmacy and Chemistry and is apparently another name for the obesity treatment marketed by the firm of Dr. Rudolf Reiss of Berlin, under the name "Adiposettes." The American distributor is H. H. Beisner, New York.

The advertising for Opti-Med tablets which has recently been sent to American physicians directly from Dr. Rudolf Reiss (Chemical Works), Berlin, includes no adequate statement of the composition of the tablets. In lieu of a quantitative declaration of the ingredients in simple terminology the German manufacturer offers the following statement, which is inadequate because no quantities are given and because two of the ingredients are described in terms which apparently are designed to conceal rather than reveal their identity: "Opti-Med contains: Extract. fuc. vesic., extract. frangulae, lecithin, tritetraboryl-bis-propantriolester, bis-oxyphenylphthalide."

In Martindale's "Extra Pharmacopeia" (London, The Pharmaceutical Press, 1936) "Adiposettes" are described as follows: "Ext. fuc. vesic. 5.9%, Ext. frangul. 8%, lecithin 1%, tetraboryl-bis-propan-triolester 30%, triphenylcarbinol-o-carbonic acid glycolate 10%."

From the foregoing statements it appears that the anti-fat tablets of Dr. Rudolf Reiss (Chemical Works) contain extract of fucus vesiculosus (bladderwrack), extract of frangula (buckthorn bark), lecithin, a derivative of a boric acid glycerin ester, and a substance which is either phenolphthalein or a closely related product. This combination of purgative drugs together with other agents not infrequently found in anti-fat nostrums is offered to physicians as "a valuable preparation, free from any undesirable by-effects," one "which effectively reduces body weight without harm to your patient." It is also claimed that

"Whilst a suitable diet (and no alcohol), is—as you know—of help, European doctors have reported successful treatments of many cases, *without* changing the mode of living of their patients."

Since the boric acid glycerin ester is stated to be the "specifically acting" constituent that increases the oxidation of fat and decreases the assimilation of food in the intestine, it may be well to recall the following excerpt from Dr. F. Zernik's article, "New Pharmaceuticals in Germany," in the *Manufacturing Chemist* of June 1935:

"Of late the medicinal products industry has devoted increasing attention to slimming preparations. After numerous official warnings or prohibitions had been issued against the dangerous nature of dinitrophenol or its derivatives, interest has been diverted towards boric acid-containing preparations. Popularity was acquired in this connection by compounds of boric acid with urea, as well as sodium compounds of boric acid. A representative of this group is adipositettes (Dr. Rudolf Reiss, Berlin), dragées combining purgatives with seaweed extract and a boric acid glyceryl ester. The German Office of Health has published a warning, pointing out that boric acid and borax, whenever administered in quantities greater than a fraction of a gram, do not belong to those preparations entirely free from undesirable action upon human beings and that, therefore, the consumption of boric acid-containing preparations for slimming purposes without medical supervision may eventually be injurious to the health. Recently the use of boric acid slimming preparations has been completely prohibited in Denmark, probably for the reason stated above."

ATTACKS OF EPIGASTRIC PAIN WITH DEFECATION

To the Editor:—**A white woman aged 53 complains of recurrent attacks of epigastric pain of severe intensity. The onset of the attacks occurred approximately two years ago, during which time they have been irregular as to frequency, sometimes not occurring for a period of months and again occurring two or three times in one week. The duration is from two to five hours. The patient's first premonition of an ensuing attack is a feeling of abdominal fulness with a desire to move the bowels. The attack comes on with severe pain; there is no abdominal tenderness and no elevation of temperature; at times there does exist a slight vertigo on arising, and often there is a chill after the pain subsides without any elevation of temperature after the chill. After the attack has passed, the patient feels no ill effects whatever except fatigue and is able to be up and about without any abdominal discomfort or gastrointestinal disturbances. There is no nausea during the attack or after. The bowels are moved two or three times during an attack but afford no relief. Various types of medication have been attempted to relieve the attack without any results. However, whisky on one occasion produced sleep but since that time has been unsuccessful. Morphine, both by mouth and hypodermically, has produced no effect on the patient. The patient gives a history of having had gallbladder colic five years ago, the nature of these attacks being entirely different from the present ones, and the diagnosis of attacks of gallstone colic was questioned at that time. The patient has developed a fear of future attacks and more or less anticipates them continuously, with a resulting depression and melancholia. The attacks, except in two instances, have occurred just before she retires and on two occasions have awakened the patient from sleep. During an attack, physical manifestations such as elevation of temperature and tenderness are essentially negative. Following a series of attacks the patient guards her diet, not because of qualitative food dyspepsia but because of a fear of another attack, and consequently loses considerable weight. However, if the attacks do not come as she anticipates she increases her diet with no ill effects and gains weight, leaving her in a happy frame of mind. The patient normally suffers from constipation but keeps the bowels open with a mild laxative, and there is definitely no history of constipation preceding an attack. I would be interested in having your opinion as to diagnosis and treatment.**

M.D., Pennsylvania.

ANSWER.—At this woman's age one would think first of definite organic disease involving perhaps the small bowel. The fact that these attacks have persisted for two years, during which time the patient hasn't come to any bad end, would tend to rule out a neoplasm or any lesion obstructing the bowel. The tendency to gain in weight is also encouraging. Lesions of the small bowel usually force the patient to operation within six months after the symptoms begin. The desire to move the bowels with attacks suggests something irritating the bowel. Apparently there are no symptoms of intestinal obstruction. The shortness of the attacks and the lack of physical indications suggest more a functional disturbance, such as is seen in rare cases of abdominal migraine. Sometimes at the menopause a typical migraine will change and produce attacks somewhat like those described. The absence of nausea speaks against the presence of migraine or of a lesion in the bowel. The fact that morphine does not work is much in favor of a functional trouble rather than an organic one.

Something like this picture can be seen in nervous persons after emotional debauches. The commonest cause, of course, of severe abdominal pain in a woman of this age would be gallstones. Gallstone attacks, however, should have responded to morphine. Naturally one would want to examine the gallbladder with x-rays to see whether it is functioning and whether it contains stones. It would be helpful to see whether after an attack the serum bilirubin goes up. The fact that attacks have awakened the patient from sleep indicates organic disease.

A remote possibility is that the patient may be responding allergically to some food; allergy is not so likely to begin at the age of 51. It might be well, however, to have the patient keep a record to see whether attacks follow the eating of any particular food.

It would be helpful in a case such as this to watch a barium sulfate meal as it passes down the small intestine to make sure that there is no obstruction anywhere. One possibility is that the attacks are due to an internal hernia, but in this case the patient would probably have come to grief before now.

In cases such as this it is generally wise not to explore the abdomen unless some definite indication is found for it. It is presumed that the knee jerks are present and that the Wassermann reaction is negative. The attacks do not much suggest a "crisis." Another lesion that has to be ruled out is a small duodenal ulcer with perforation posteriorly. In such cases one can generally obtain a history of ulcer many years before. One might think also of pancreatic stones and perhaps arteriosclerotic changes in the mesenteric blood vessels. Such changes are common but generally silent. One would think of a lesion of the spinal cord, but this probably would have brought serious trouble in the course of two years.

STAINED LIPS FROM SMOKING

To the Editor:—**Could you tell me why nicotine stain should collect on my lips while smoking? It is much heavier with cigarets than with a pipe. The staining is so heavy it produces a dark brown discoloration on handkerchiefs, which wash with great difficulty. I smoked about three packs of cigarets for a period of five years when one day I noticed on my lips a dark brown stain which would rub off easily. I tried a holder and then filters, without an iota of help. I changed to pipe smoking and the stain is greatly improved. Nevertheless, some still collects. I have absolutely no discomfort—never have cracked or chapped lips. Could you suggest any treatment?**

M.D., New York.

ANSWER.—This experience seems unique. None of the smokers of cigarets, dentists or physicians consulted have noted staining of the lips by cigarets. Tobacco of any kind will produce a brown juice when chewed. This is not due to nicotine, which is a colorless liquid turning brown only on aging.

As the color rubs off easily one should not be too concerned. Perhaps smearing the lips with petrolatum or a wax pomade would be helpful. Paper handkerchiefs, easily obtained, would avoid the staining of linen.

SULFANILAMIDE FOR TYPHOID CARRIERS

To the Editor:—**Kindly send references on the use of sulfanilamide for typhoid carriers. What is the present consensus as to its value in this connection?**

M.D., Virginia.

ANSWER.—One reference has been found to the use of sulfanilamide in the control of the typhoid or paratyphoid carrier state. A. T. Bazin (*Canad. M. A. J.* **38**:559 [June] 1938) reported that he had been able to eradicate paratyphoid bacilli from the bile of a carrier by intensive therapy with sulfanilamide. It would seem from the literature however that, since sulfanilamide has not been especially effective in the control of clinical typhoid and paratyphoid infections, its use in the carrier state would not be of great value unless one was dealing with urinary tract carriers. For this type of carrier sulfanilamide might be of some value because one can obtain high concentrations of the drug in the urine of treated persons provided adequate quantities of the drug are prescribed.

DILUTIONS FOR TUBERCULIN TESTING

To the Editor:—**Each fall my associates and I do 1,500 tuberculin tests, using two strengths of purified protein derivative. We could considerably reduce the cost of this procedure if we bought only a stronger dilution and made up the weaker dilutions ourselves. Will you please send us directions for making up the proper diluting fluid.**

Edgar S. Krug, M.D., State College, Pa.

ANSWER.—Since the second dose is 250 times the strength of the first, the simplest way to achieve the desired first dose from a second strength tablet would be to dissolve a second strength tablet in 250 cc. instead of 1 cc. of the buffer solution. This would yield a solution containing 2,500 doses. Since this is probably greatly in excess of what would be used within the keeping limits of the diluted solution, a smaller quantity would be preferable. This can be prepared by making dilution in two stages: e. g., dissolve one second strength tablet in 1 cc. of buffer solution, withdraw exactly 0.1 cc. with a sterile calibrated syringe and add it to 24.9 cc. of sterile buffer, or salt, solution. Each 0.1 cc. of the resulting 25 cc. will furnish the required first dose.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: *Basic Science.* Tucson, Dec. 19. Sec., Dr. Robert L. Nugent, University of Arizona, Tucson.

ARKANSAS: *Basic Science.* Little Rock, Oct. 23. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, Nov. 9-10. Sec., Dr. D. L. Owens, Harrison. *Medical (Eclectic).* Little Rock, Nov. 9-10. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written examination.* Sacramento, Oct. 16-19. *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, Nov. 15. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Basic Science.* New Haven, Oct. 14. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven. *Medical (Regular). Examination.* Hartford, Nov. 14-15. *Endorsement.* Hartford, Nov. 28. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Medical (Homeopathic).* Derby, Nov. 14-15. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: *Examination.* Dover, July 9-11. *Reciprocity.* Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Oct. 23-24. *Medical.* Washington, Nov. 13-14. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 13-14. Sec., Dr. William M. Rowlett, Box 786, Tampa.

ILLINOIS: Chicago, Oct. 17-19. Acting Superintendent of Registration, Department of Registration and Education, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Topeka, Dec. 12-13. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 5-7. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, Nov. 14-15. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Regular.* Baltimore, Dec. 12-15. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 12-13. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 14-16. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MINNESOTA: Minneapolis, Oct. 17-19. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: Kansas City, Oct. 26-28. Sec., State Board of Health, Dr. Harry F. Parker, State Capitol Bldg., Jefferson City.

NEBRASKA: Lincoln, Nov. 24-25. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Written examination and reciprocity with oral examination.* Carson City, Nov. 6. Sec., Dr. John E. Worden, 311 W. Robinson St., Carson City.

NEW JERSEY: Trenton, Oct. 17-18. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NORTH CAROLINA: *Reciprocity and Endorsement.* Raleigh, Dec. 11. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 2-5. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, Dec. 5-7. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Basic Science.* Oklahoma City, Nov. 6. Sec. of State, Hon. C. C. Childress, State Capitol, Oklahoma City. *Medical.* Oklahoma City, Dec. 13. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science.* Portland, Oct. 28. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia, January. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, Department of Public Instruction, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, Nov. 14. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, Jan. 16-17. Dir., Medical Licensure, Dr. G. J. Van Heuvelen, State Board of Health, Pierre.

TEXAS: Austin, Nov. 20-22. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 13-15. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 13. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Fairmont, Nov. 6-8. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 2. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical.* Madison, Jan. 9-11. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.

Delaware July Report

Dr. Joseph S. McDaniel, secretary, Medical Council of Delaware, reports the written examination held at Dover, July 11-13, 1939. The examination covered ten subjects and included 100 questions. Seventy-five per cent in each subject was required to pass. Thirteen candidates were examined, eleven of whom passed and two failed. Three physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1938)	85
University of Maryland School of Medicine and College of Physicians and Surgeons		(1937)	80
Hahnemann Medical College and Hospital of Philadelphia		(1937)	77, (1938) 78
Jefferson Medical College of Philadelphia		(1937)	78, 81, (1938) 80, 81
Temple University School of Medicine		(1938)	79
University of Pennsylvania School of Medicine		(1937)	82, 83

School	FAILED	Year Grad.	Per Cent
Hahnemann Med. College and Hospital of Philadelphia		(1938)	75.2
University of Pennsylvania School of Medicine		(1937)	75.2

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine		(1933)	Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons		(1924)	Maryland
New York Homeopathic Medical College and Flower Hospital		(1916)	New York

Arizona July Report

Dr. J. H. Patterson, secretary, Arizona State Board of Medical Examiners, reports the written examination held at Phoenix, July 5-6, 1939. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. Five physicians were licensed by reciprocity and one physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of California Medical School		(1937)	81.5
Louisiana State University Medical Center		(1938)	84.3
Baylor University College of Medicine		(1938)	83.7

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
State University of Iowa College of Medicine		(1936)	Iowa
St. Louis University School of Medicine		(1936)	Missouri
Jefferson Medical College of Philadelphia		(1932)	Penna.
Vanderbilt University School of Medicine		(1927)	Tennessee
McGill University Faculty of Medicine		(1924)	California

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Duke University School of Medicine		(1934)	N. B. M. Ex.

Georgia June Examination

Mr. R. C. Coleman, joint-secretary, State Examining Boards, reports the written examination held by the State Board of Medical Examiners at Atlanta and Augusta, June 7-8, 1939. The examination covered ten subjects and included 100 questions. An average of 80 per cent was required to pass. Seventy-eight candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1939)	82.5, 87.8
Emory University School of Medicine		(1938)	83.2, 88.2, (1939) 82, 83.5, 84.6, 84.6, 84.8, 84.8, 84.9, 84.9, 84.9, 85.1, 85.2, 85.2, 85.3, 85.8, 85.9, 85.9, 86, 86.2, 86.2, 86.4, 86.5, 86.6, 87.4, 87.9, 88, 88.1, 88.1, 88.5, 88.7, 88.8, 88.8, 89.5, 90, 90.4, 90.6, 90.7, 94.6
University of Georgia School of Medicine		(1939)	80.9, 81.1, 81.5, 81.8, 82, 83.1, 83.4, 83.8, 83.9, 84, 84.2, 84.7, 84.8, 85, 85, 85, 85.2, 85.2, 85.3, 85.3, 85.7, 86, 86.1, 86.1, 86.3, 86.5, 86.9, 87.7, 87.8, 91.2
Harvard Medical School		(1935)	85, 85.3
Columbia University College of Physicians and Surgeons		(1939)	90.3
Cornell University Medical College		(1937)	84.3
New York Medical College and Flower Hospital		(1937)	88.4
University of Oregon Medical School		(1937)	85.4
Deutsche Universität Medizinische Fakultät, Prag		(1911)	84.2

Twenty physicians were licensed by reciprocity and two physicians were licensed by endorsement from January 5 through July 6. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School		(1927)	Missouri
University of Illinois College of Medicine		(1935)	California
University of Louisville School of Medicine		(1933)	Kentucky
Tulane University of Louisiana School of Medicine		(1933), (1935)	Alabama, (1935), (1937) Louisiana
University of Michigan Medical School		(1936)	Minnesota
New York University College of Medicine		(1935)	New York
Jefferson Medical College of Philadelphia		(1924)	S. Carolina
Medical College of the State of South Carolina		(1937)	S. Carolina
University of Tennessee College of Medicine		(1932, 2), (1936), (1937, 2)	Tennessee
Vanderbilt University School of Medicine		(1900) (1935), (1936)	Utah, Tennessee
University of Wisconsin Medical School		(1933)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Western Reserve University School of Medicine		(1935)	N. B. M. Ex.
Vanderbilt University School of Medicine		(1934)	N. B. M. Ex.

Book Notices

The Structure and Composition of Foods. By Andrew L. Winton, Ph.D., and Kate Barber Winton, Ph.D. Volume IV: Sugar, Sirup, Honey, Tea, Coffee, Cocoa, Spices, Extracts, Yeast, Baking Powder. Cloth. Price, $9. Pp. 580, with 134 illustrations. New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Limited, 1939.

The present book completes this notable series of four volumes on foods. It includes four parts, or sections, on sugar, syrup and other saccharine products, on so-called alkaloidal products, on spices and extracts and other flavoring materials, and on leavening agents such as yeast and baking powders. There is also a chapter of addenda to volumes II and III of the series. It is in the sections on food adjuncts particularly that the value of the authors' method of presentation is apparent. There is presented not only the usual description of chemical composition but also a discussion of each subject from the botanic point of view, illustrated by numerous excellent drawings of cell structures. Many of the spices can be better identified by determination of the morphologic characteristics of material under examination than by chemical analysis. Although the botanic method of description and classification has been emphasized, the chemical presentation has not been neglected. The book is suitably indexed. It is the kind of book one may turn to with confidence to find information on inquiries such as What is the composition of maple syrup from different parts of the country? What is caramel? What enzymes have been found in honey? What products have been found in coffee, tea and cocoa? What is the nature of oil of peppermint? What alkaloids have been found in pepper? What is the difference between paprika and pimiento? What are the constituents of bakers' yeast? How are baking powders classified? This volume is a fitting conclusion to the encyclopedic series. The set comprises a veritable mine of information about the structure and composition of foods and food adjuncts, written by experts who have had a lifetime of experience in the field.

Traité d'ophtalmologie. Publié sous les auspices de la Société française d'ophtalmologie. Par MM. F. Bailliart, Ch. Coutela, E. Redslob, E. Velter. René Onfray: Secrétaire général. Tome I: Histoire, embryologie, anatomie. Par MM. L. Cerise et al. Cloth. Pp. 1,042, with illustrations. Paris: Masson & Cie, 1939.

This is the first of an eight volume treatise on ophthalmology sponsered by the French Society of Ophthalmology with completion promised in less than a year. There are 103 collaborators from France, Belgium and Switzerland. A general table of the entire material to be covered is in the beginning of the first volume and an alphabetical index of all the volumes is promised for the end of the eighth volume. At the end of each chapter is a moderate sized but comprehensive bibliography embracing the modern literature in all languages. A rather interesting and useful novelty is the printing on each page of just where the bibliography pertaining to the subject matter of that page is to be found.

The three fairly modern compilations of ophthalmology are the Graefe-Saemisch Handbuch (which has taken forty years for completion), the Kurzes Handbuch der Ophthalmologie and the American Encyclopedia of Ophthalmology. The new French traité does not follow the pattern set by any of these but branches out boldly on a new path of its own. That path conforms to the advances of the recent decades, even though each collaborator has been allowed full sway to handle his subject matter as he has seen fit. If the clinical parts of the traité maintain the standards set by the first volume, the ophthalmologic world will have something new and valuable.

The first volume opens with an elaborate table of contents preceded by the names, titles and locations of the collaborators. Then comes a short and somewhat inadequate history of ophthalmology by Villard of Montpellier. The general development of the visual apparatus was written by Leplat of Liége, is well done, and has some original illustrations of embryos from the collection of the University of Liége. This is followed by a chapter on the embryology of the different parts of the ocular apparatus by Dejean of Montpellier. Although not lengthy, the material is well presented and well illustrated. A short chapter on comparative embryology and phylogenesis of the visual apparatus by the same author follows. Then comes a long and detailed description of the anatomy and histology of the orbit and the ocular adnexa by Winckler of Strasbourg. This is well illustrated with many photographs of original dissections and diagrams of intra-orbital contents. This chapter is particularly good, for it contains much material that cannot be found elsewhere. The anatomy and histology of the lacrimal system and of the vascular system of the ocular apparatus was written by Jayle of Marseilles. The crowning section of the volume, however, is the chapter on the anatomy and histology of the eyeball by Redslob of Strasbourg. Every ophthalmologist, no matter how experienced, can read that with profit. Then follow the shorter chapters on the anatomy of the optic pathways by Lhermitte of Paris, the anatomy of the oculomotor nervous system by Van Gehuchten of Louvain, the anatomic pathways for ocular sensibility by Cerise and Thurel of Paris, the anatomy of the sympathetic and parasympathetic nervous system of the ocular apparatus by Tournay of Paris and comparative anatomy and physiology by Rochon-Duvigneaud of Paris. The last two and somewhat longer chapters on heredity and teratology are by Van Duyse of Ghent.

In a review of this character it is of course impossible even to try to evaluate each individual chapter. Suffice it to say that a high standard of excellence is maintained throughout the volume, which occupies a somewhat unique place in ophthalmic literature. The volume is printed on rather thin paper, according to our standards, and the type is somewhat fainter and smaller than we are accustomed to use. The illustrations are uniformly excellent, the majority being in black and white. However, the few colored illustrations give great promise for the volume that will cover diseases of the fundus. In producing this eight volume work the French Society of Ophthalmology is making a distinct contribution to modern ophthalmology. For all libraries and readers of French, this encyclopedia is a necessity.

You're the Doctor. By Victor Heiser, M.D. Cloth. Price, $2.50. Pp. 300. New York: W. W. Norton & Company, Inc., 1939.

This is a rambling, somewhat discursive, book on health which discusses many phases of the subject, few of them adequately and many of them superficially. Readers of An American Doctor's Odyssey will be disappointed. The book contains some interesting anecdotes based on the author's worldwide experience and travels but it lacks the vivid and interesting qualities of his odyssey.

On page 84 his first paragraph on vitamin C mentions the most concentrated source as paprika, but paprika cannot be used in significant amounts to make a real contribution of vitamin C to the diet, as can oranges, lemons, grapefruit, tomatoes and raw cabbage; he mentions only tomatoes specifically and singles out no fruits or vegetables as exceptionally good sources of vitamin C, except boiled potatoes.

On page 201, in a brief paragraph on hernia, he says "Operative cure is usually simple and recently, under certain conditions, some have been effected medically without aid of the surgeon by injecting irritating substances." This is misleading; the safety of injection methods depends on the careful selection of cases and the technic of a well qualified surgeon.

On page 250 he credits the supervision of small private hospitals to municipal health departments and makes no mention of the American Medical Association Council on Medical Education and Hospitals, the American College of Surgeons or the American Hospital Association; all these have contributed infinitely more to improvement of hospital standards in the United States than has any health department, except so far as a few of the larger municipalities may operate their own hospitals. Even these have been known to be unacceptable to professional agencies adhering to high standards.

On page 253 he says that outbreaks of measles can be suppressed quickly by injecting serum. Health officials seem to have overlooked the availability of a quick means of suppressing measles epidemics; the truth is, of course, that mortality has been curtailed by the use of convalescent serum but never has there been available an adequate supply of this preparation and never has any considerable epidemic been suppressed by this technic.

On page 261, after recounting how he procured the cooperation of many agencies in a proposed new health program for

Halifax, he says "Only after an hour and a half conference did the Halifax Medical Association agree." With reference to no other agency does the author use this implication of reluctance when, as a matter of fact, an hour and a half seems hardly a long conference if it results in the enlistment of cooperation for an entirely new health program for an important seaport like Halifax.

These statements are chosen at random in support of the reviewer's opinion that the book is poorly organized and unbalanced. It is of course an assemblage of essays written from time to time for a variety of publications.

A Cerebral Atlas Illustrating the Differences Between the Brains of Mentally Defective and Normal Individuals with a Social, Mental, and Neurological Record of 120 Defectives During Life. By Richard J. A. Berry, M.D., F.R.S.E., F.R.C.S.E., Director of Medical Services to the Incorporation of National Institutions for Persons Requiring Care and Control, Stoke Park Colony, Bristol. Cloth. Price, $35. Pp. 425, with 441 illustrations. New York, Toronto & London: Oxford University Press, 1938.

The study conducted by Dr. Berry and his associates has consisted of the correlation of clinical observations with physiologic and anatomic evidence. He has compared the brains of idiots, imbeciles, moral defectives and feebleminded persons with those of normal persons. He has compared them as to actual size by the brain product method, he has compared them as to weights of the right cerebral hemisphere and he has compared the planimeter cortical areas as determined on the flat by dioptrographic tracings. He has also compared as to morphologic changes grossly and microscopically the brains of feebleminded persons with those of normal persons.

In determining the actual size of the brain by the brain product method, he multiplied the length by the breadth and the height of the brain by dioptrographic tracings and for practical purposes used the same measurements on the head and assumed that the proportion of brain size is about 66 per cent; that is, the brain is about two thirds the size of the head. In estimating the weight of the brain, the right cerebral hemisphere alone of both normal and defective persons is stripped, mounted in formaldehyde-saline solution and weighed after the removal of all superfluous fluid either inside or outside the brain. Surface areas of the brains of normal and feebleminded persons were calculated by dioptrographic tracings. Comparisons of respective areas in normal and diseased brains were made to bring out the morphologic differences.

Dr. Berry's atlas is of inestimable value, since each series of photographs is accompanied by a thorough history and neurologic examination in the case prior to death of the patient, as well as computations as to the actual size of the brain product and the weight of the right cerebral hemisphere and cortical areas. The photographs in every instance illustrate the gross morphologic changes.

In summary the author states that, during its growth from birth to adult, the average brain increases in weight by roughly 1,000 Gm. According to Donaldson, it does so by an increase of its non-nervous constituents and by an enlargement of its nerve elements:

> These latter changes are dependent on the increase in the mass of the cell body and cell outgrowth, especially the axons, and in the acquisition of the medullary sheath. Calculation shows that the absolute mass of the medullary substance is the chief source of increase in weight during this period. The weight increase in the nerve element proper is due to the enlargement of those cells which at birth are small, the addition of nerve cells being excluded since their formation ceased at birth.

The author further states that if, therefore, a defective brain is found to weigh less than a comparable normal brain—the two having been weighed under strictly similar conditions—to be appreciably smaller and to possess a corpus callosum (through which all medullated neopallial commissural axons must pass) smaller than normal, it is a reasonable inference that the brain is deficient in its number of fully developed and properly functioning cortical neurons and hence is incapable of achieving that type of mental reaction which distinguishes man from the animals. On the whole, the brains of idiots are 10 per cent smaller than the brains of normal persons:

> The chief differences between defective brains and a normal one of the type described may be summarized briefly as follows. In a defective brain there is:
>
> 1. A considerable reduction in size and weight.
> 2. A tendency for the persistence in the convolutional pattern of certain prenatal development features.
> 3. A greater variation than occurs normally in the gyri and sulci bordering the central sulcus of Rolando—that is, in the important effector and receptor areas.
> 4. A lack of full development in the opercula, particularly in the frontal one, which frequently fails to cover the insula.
> 5. A diminution in the cortical amount of the triangular parietal area—that is, of the area concerned with the association of incoming impulses from the somesthetic, acoustic and visual areas.
> 6. On the medial surface the corpus callosum appears to be frequently diminished in size, notably the genu and splenium.
> 7. The visual areas exhibit more variation in pattern and extent.
> 8. Lastly, the sulci generally appear to be shallower in the defective brain than in the normal.
>
> Hammarberg, in his classic studies of normal and idiot brains, long ago pointed out that even comparatively small diminutions in the development of the cortical cells were sufficient to reduce the intelligence to moderate imbecility. Any of the variations just described as of frequent occurrence in the defective brain have a precisely similar effect.

The reviewing of this work has been exceedingly interesting and instructive. The author has presented comparisons of defective brains with those of the normal brain as no other author has done. The presentation of the clinical symptoms due to morphologic changes in the brain elucidates the problem of the mentally defective. The atlas not only is of value to the anatomist and physiologist but should be an excellent reference work for every neurologist and psychiatrist.

Alcoholics Anonymous: The Story of How More Than One Hundred Men Have Recovered from Alcoholism. Cloth. Price, $3.50. Pp. 400. New York: Works Publishing Company, 1939.

The seriousness of the psychiatric and social problem represented by addiction to alcohol is generally underestimated by those not intimately familiar with the tragedies in the families of victims or the resistance addicts offer to any effective treatment. Many psychiatrists regard addiction to alcohol as having a more pessimistic prognosis than schizophrenia. For many years the public was beguiled into believing that short courses of enforced abstinence and catharsis in "institutes" and "rest homes" would do the trick, and now that the failure of such temporizing has become common knowledge, a considerable number of other forms of quack treatment have sprung up. The book under review is a curious combination of organizing propaganda and religious exhortation. It is in no sense a scientific book, although it is introduced by a letter from a physician who claims to know some of the anonymous contributors who have been "cured" of addiction to alcohol and have joined together in an organization which would save other addicts by a kind of religious conversion. The book contains instructions as to how to intrigue the alcoholic addict into the acceptance of divine guidance in place of alcohol in terms strongly reminiscent of Dale Carnegie and the adherents of the Buchman ("Oxford") movement. The one valid thing in the book is the recognition of the seriousness of addiction to alcohol. Other than this, the book has no scientific merit or interest.

Milk Supplies and Their Control in American Urban Communities of Over 1,000 Population in 1936. By A. W. Fuchs, Senior Sanitary Engineer, and L. C. Frank, Senior Sanitary Engineer. From the Division of Public Health Methods, National Institute of Health. Prepared by direction of the Surgeon General. U. S. Treasury Department, Public Health Service. Public Health Bulletin No. 245. Paper. Price, 10 cents. Pp. 70. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

This pamphlet provides the results of a study conducted by the U. S. Public Health Service on the production and consumption of fluid market milk, the volume and price of various grades of milk sold, the legal requirements and the extent of both pasteurization of milk and of the testing of milk cows for tuberculosis or infectious abortion, state and local milk control organization and personnel, and the inspection, sampling and bacterial quality of local milk supplies. The information which forms the basis of the report was secured by means of the questionnaire method and by correspondence, and there was made available information from more than 2,500 municipalities. It was found that nearly 75 per cent of the market milk in the municipalities studied was pasteurized and that 99.4 per cent was from tuberculin tested herds. It is pointed out that since 1923 there have been phenomenal progress in abortion testing in cattle, extensive progress in tuberculin testing and considerable progress in pasteurization. It is interesting to note from this survey that the daily per capita consumption for the entire country is estimated to be 0.66 pint of fluid market milk, 0.035 pint of cream and 0.031 pint of buttermilk, or a total of 0.73

pint. The total milk consumption was lowest in the Southern states and highest in New England. It is estimated that 36 per cent of the municipalities had a milk ordinance. Control of milk sanitation work was a function of the health department in twenty-two states, of the department of agriculture in twelve, jointly of health and agricultural departments in ten, and of some other agency in four. Some degree of local milk control was exercised in about one third of all municipalities. Milk supplies for the larger cities apparently are subjected to greater control than those of smaller municipalities. The information provided by this pamphlet should be valuable to all who are interested in statistics on the sanitation and consumption of fluid milk.

Électrocardiographie expérimentale: Application à la physio-pathologie du cœur, dualité du cœur, arythmies. Par le Docteur E. de Somer, professeur de pathologie générale à l'Université de Gand. Préface du Prof. Dr. Wenckebach. Paper. Pp. 142, with 122 illustrations. Paris: Masson & Cie, 1938.

In this brochure the author presents data on which he attempts to outline his ideas regarding the genesis of the electrocardiogram. There is little reference to the literature, the presentation is polemic, the views expressed are unorthodox, the evidence is unconvincing and the method of recording the electrocardiogram is unconventional. The spacing of the booklet into three separate parts containing respectively the text, the illustrations and the legends makes it extremely difficult to follow the abstruse presentation. Apparently the author is convinced of the dualistic theory of the origin of the heart beat, namely that there is one pacemaker for the auricles and another for the ventricles. This view has cropped up before and will probably appear again, but it has few advocates, and none apparently among the leading students of this subject.

Annual Review of Biochemistry. James Murray Luck, Editor. James H. C. Smith, Associate Editor. Volume VIII. Cloth. Price, $5. Pp. 676. Stanford University P. O., California: Annual Reviews, Inc., 1939.

The eighth volume of these now indispensable reviews of annual advances in biochemistry is the first since the establishment of the companion volume known as the Annual Review of Physiology. It is the conviction of the editorial board that the publication of two sets of reviews will considerably ease the trials of the authors. To the present commentator it seems to be a mistake to separate two closely allied subjects such as biochemistry and physiology, and one criticism of the articles in the present volume is that the physiologic aspects are too often omitted. Perhaps this is necessary, but it is unfortunate to establish any line of demarcation when none exists. The difficulties presented to the reader because of emphasis on chemistry may be exemplified perhaps by the following sentence, which appears in an authoritative review of the alkaloids: "The alkamine retronecine, the basic fragment from the hydrolysis of senecionine, retrosine, jacobine, squalidine, trichodesmine and seneciphylline, is converted by hydrogenation to retronecanol, $C_8H_{15}NO$."

The subjects in the present volume include biologic oxidations and reductions, proteolytic enzymes, nonproteolytic enzymes, polysaccharides and lignin, x-ray studies of the structure of compounds of biologic interest, the chemistry of the acyclic constituents of natural fats and oils, the chemistry of proteins and amino acids, the chemistry and metabolism of the compounds of sulfur, carbohydrate metabolism, lipid metabolism, metabolism of proteins and amino acids, mineral metabolism (calcium, magnesium and phosphorus), hormones, choline as a dietary factor, the water-soluble vitamins, the fat-soluble vitamins, metabolism of brain and nerve, the alkaloids, chemical aspects of photosynthesis, mineral nutrition of plants, growth hormones in the higher plants, animal poisons, ruminant nutrition, immunochemistry and the biochemistry of yeast. There is an author index and a subject index.

It is apparent from the list that some topics are so broad that much more space should be provided for their appropriate presentation. There is still too much mere cataloguing of papers without discussion or even mention of the results obtained. Thus in a discussion of molecular weight determinations of proteins there appears the sentence "Sumner, Gralen and Eriksson-Quensel (1, 2, 3) studied the crystalline proteins, urease, canavalin, concanavalin A, and concanavalin B, from the jack bean." The only way the reader can find out what values were found is to refer to the papers cited as numbers 1, 2 and 3. There is almost a page devoted to the discussion of molecular weight determination of proteins, and, although some values are recorded, it would be much more satisfactory to the reader if all the values were listed in a table. There are excellent tables of coenzyme specificity of dehydrogenases and tables of utilization of amino acid derivatives for growth.

Ernährungslehre: Grundlagen und Anwendung. Bearbeitet von B. Bleyer et al. Herausgegeben von Professor Dr. Wilhelm Stepp, Direktor der 1. Medizinischen Klinik der Universität München. Cloth. Price, 36 marks. Pp. 622, with 34 illustrations. Berlin: Julius Springer, 1939.

This is a modern textbook on nutrition written in German by seventeen contributors in addition to the editor. It is interesting to note the many references to American work as compared with the relatively few citations in some of the standard German textbooks of twenty or thirty years ago. In the discussion of energy requirements the work of F. G. Benedict, Du Bois and Boothby and their collaborators is discussed at length. The recent work of W. C. Rose, Brand, Lewis, du Vigneaud and others on the nutritional significance of the amino acids, including the recent work on the homologues of cystine, is presented. The expression "protective food" has been introduced into the German language as "schutzstoffe." Discussion of some subjects, such as mineral metabolism, is brief, as is necessary perhaps because of the nature of the book. The chemistry of the vitamins is presented fully but briefly. Each chapter contains a selected bibliography. The references presented in the discussion of nicotinic acid and pellagra are not the most important papers. An interesting chapter by Schittenhelm discusses undernutrition and overnutrition and the "mehlnährschaden" of Czerny and Keller. The subjects in the section on avitaminosis and hypovitaminosis are well presented. The final section is an interesting discussion of nutrition as a public health problem, in which evidence regarding the requirements of different peoples is gathered together and discussed in the light of current information.

Principles of Healthful Living. By Edgar F. Van Buskirk, Ph.D., Professor of Hygiene and Health Education, Stephens College. Edited by Wilson G. Smillie, M.D., Professor of Public Health, Cornell University Medical College. Cloth. Price, $3. Pp. 386, with illustrations. New York: Dial Press, 1938.

This is a good textbook on hygiene at the college level. It is also a good reference book for the home, assuming that the education of the family is of high school level or above. It is not sufficiently appealing in style or treatment for the more or less casual reading of those who are mildly interested but not seriously concerned in making a study of health and hygiene. It deals in a comprehensive manner with the structure and functions of the body and its environment, placing a highly desirable emphasis on preventive medicine and at the time giving introductory information with relation to the principal diseases which afflict man. It does not encourage self medication but encourages what the author calls "reflective thinking" as a means of evaluating advertising claims with relation to health and attempts to develop a critical attitude toward such claims without at the same time discrediting honest commercial promotion. It should make a good basis for any course in hygiene and healthful living or for collateral reading and reference. In the critical sections relating to diet, the use of narcotics and stimulants, personality development and mental hygiene—in short, those places where faddism might easily have crept in—it is eminently sound. The book is attractively printed, with many simple and clear diagrams illustrating the anatomic structures, and is embellished with numerous photographs of excellent quality, sharply reproduced and intelligently employed. It has a good bibliography and an excellent index.

A banana: Fruto de todo o ano alimento-medicamento. Pelo Dr. Vicente Henriques de Gouvela. Resumée en français. Paper. Pp. 75, with 18 illustrations. Funchal, Portugal: The Author, 1938.

This is a discussion in Portuguese, with a French summary, about the composition and nutritional value of the banana. Unfortunately no references are provided to the original literature and the monograph itself presents no new facts.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Corporations: Group Health Association, Inc., Held Not Illegally Engaged in the Corporate Practice of Medicine or in the Insurance Business. — Group Health Association, a corporation not for profit, was organized under the laws of the District of Columbia providing for corporations for "benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts." It undertook to provide medical and hospital services to its members and their dependents on a monthly prepayment basis. According to the published report, its membership is "limited to employees of the government in certain of the administrative branches." It entered into a contract with the Home Owners Loan Corporation whereby the latter agreed to pay $40,000 in consideration of the association's providing for two years from Nov. 1, 1937, "substantially complete medical and hospital service to such employees of the Home Owners Loan Corporation as care to join it on a reasonable monthly payment basis." The United States District Attorney for the District of Columbia, claiming that the association was illegally engaged in the practice of medicine in violation of the Healing Arts Practice Act, notified the association that unless it suspended immediately its activities he would file a bill for an injunction or institute proceedings for the involuntary dissolution of the corporation. The Superintendent of Insurance for the District of Columbia contended that the association was engaged in the business of insurance in violation of the insurance laws of the District of Columbia. The association thereupon filed a bill of complaint in the district court of the United States for the District of Columbia against the district attorney and the superintendent of insurance. The defendants moved that the bill of complaint be dismissed.

Group Health Association, said the district court, was not practicing medicine in the sense that it itself prescribed for the sick. It was the contention of the association that it entered into contracts only with duly licensed physicians who themselves attended its members and if necessary prescribed for them. The court could see no reason why an individual or a group of individuals may not contract with a physician, or a group of physicians, for medical services for a stipulated period at a fixed compensation without violating the Healing Arts Practice Act. It seemed to the court that such a group of individuals might incorporate themselves for their own mutual benefit for the same purpose and that such a corporation, not for profit but for the mutual benefit of its members, would not be engaged in the practice of medicine or would not be holding itself out as doing so. While a corporation can act only through its agents and employees, the physicians with whom Group Health Association contracted to render medical services were, in the opinion of the court, independent contractors, for the association "does not in any way undertake to control the manner in which they attend or prescribe for their patients."

While the court expressed itself as having more difficulty with the contract between the association and the Home Owners Loan Corporation, it concluded that the medical and hospital services which the association agreed to furnish to the members of that corporation were substantially the same as those furnished to its own members. No profit was to be made for the association or its members.

The purpose of the Healing Arts Practice Act, the court continued, was to protect the public from quacks, the ignorant and incompetent. The activities of the association in no way tended to commercialize the practice of medicine, as the court viewed them; the association was not in the business of making money by furnishing medical services to any one who might come along. The court did not believe that the cases bearing on the right of a corporation to practice law were closely analogous, "they being based on the common law and governed by the courts independently of any statute." For the reasons stated, the court held that the activities of the association did not constitute a violation of the Healing Arts Practice Act.

The contention of the superintendent of insurance that the association was unlawfully engaged in the business of insurance was based on the following provision of the insurance laws of the District of Columbia:

> Every corporation . . . transacting business in the District of Columbia, which collects premiums, dues, or assessments . . . and which provides for the payment of indemnity on account of sickness or accident, or a benefit in case of death, shall be known as "health, accident, and life insurance companies or associations."

This provision, the court pointed out, does not include all "insurance" companies but only those which provide for the "payment of indemnity on account of sickness"; it does not include necessarily contracts "to indemnify," but is limited to those which provide for the "payment" of indemnity. The word "payment," the court continued, as ordinarily used means the payment of money, and the court could find no reason to believe that the word "is used in a different sense in the statute or that it is equivalent to 'indemnity.'" In the opinion of the court, the association was not engaged in the business of insurance within the meaning of the quoted provision of the law.

Accordingly, the district court overruled the motion to dismiss the bill of complaint.—*Group Health Ass'n v. Moor et al., 24 F. Supp. 445.*

Malpractice: Volkmann's Paralysis Allegedly Resulting from Improper Application of Plaster of Paris Cast. —Dewey Dark Jr., a boy aged 6 years, suffered greenstick fractures of both the ulna and the radius of the left arm on Thursday, March 4, 1937. Dr. Brown, a local physician, was called in but, since in his opinion it was necessary to "x-ray" the arm before administering any treatment, the child was taken to Dr. McAdams in a neighboring town. Dr. McAdams, after studying roentgenograms, reduced the fractures and applied a plaster of paris cast "next to the flesh," bending the elbow just before the cast hardened, which caused the cast to wrinkle at the elbow. The following day the arm began to swell, but Dr. Brown did not believe that the cast needed loosening. Saturday and Sunday nights Dr. Brown administered hypodermics and on Sunday loosened the bandage. When the child was taken back to Dr. McAdams on Monday the physician removed the dressing and drained and sterilized blisters which had formed on the top of the arm and on the hand. According to his testimony, at that time the pulse was good, there was no blueness in the fingers and the child could move his hand. The father testified, however, that at that time "inside the elbow it was black." Although the physician urged the father to hospitalize the child, the father failed to do so for two more days, in the meantime bringing the child to Dr. McAdams each day. The child was hospitalized Wednesday, the 10th, at which time he had a temperature of 103 F. Dr. McAdams removed the splint and the dressing and elevated the arm on a pillow. While the child was in the hospital, according to Dr. McAdams, the "temperature went down to practically normal, swelling was much better, the blisters looked better, he had a good pulse, and movement in his wrist and fingers" and he was free of pain. Over Dr. McAdams's objections the father removed the child from the hospital on March 12 and dismissed Dr. McAdams from the case, informing the physician that "he could get the boy attended to nearer home," mentioning a Dr. Cooper and saying nothing concerning Dr. Brown. Consequently Dr. McAdams gave Dr. Brown no instructions for treatment. Apparently, however, the father placed the child under Dr. Brown's care from then until March 22, when he was taken to the Dr. Cooper just referred to. When Dr. Cooper came into the case he found that the arm was swollen twice the normal size, the child had a high temperature, there was "no circulation" and the tissue was sloughing off in a spot about 2 inches long by 1½ inches wide. May 16, on Dr. Cooper's advice, the child was taken to Dr. Speed, a bone specialist in Memphis. Roentgenograms, Dr. Speed

testified, while showing a fracture of both bones of the forearm, destruction of one bone, osteomyelitis of this bone and to a certain extent other bones, showed excellent apposition of the bones at the points of fracture. Apparently Volkmann's paralysis had developed, the fingers had become stiff and the arm was useless, and subsequent procedures by the specialist were fruitless.

The father and the child subsequently sued Dr. Brown and Dr. McAdams for malpractice. The substance of their complaint was that "there was a want of skill on the part of McAdams and Brown, who acted jointly in applying the treatment—that the cast was applied too tightly, and when it was bent to accommodate the arm in a sling, wrinkles formed in the interior of the cast and, when it set or hardened, these wrinkles bruised the flesh when swelling occurred—a condition brought about through failure of the physicians to place yielding or resilient material between the flesh and the cast." From a judgment for the plaintiffs the defendants appealed to the Supreme Court of Arkansas.

The determining questions, as the Supreme Court viewed the controversy, were whether or not the cast was applied too tightly and whether or not it was good medical practice to place the cast in contact with the skin. From the fact, said the Supreme Court, that wrinkles did form in the cast at or near the elbow, it cannot be concluded that the infection complained of was caused thereby, and the evidence adduced justifies no such conclusion. Dr. Speed testified that the disability of the child was due to Volkmann's paralysis, which can result from a number of different causes: It might be the result of a direct injury to the blood vessels of the arm when the blood supply is cut off to the muscles; it might be due to hemorrhage or swelling within the fasciae covering of the arm, or it might be due to stricture due to splinting or pressure. He was unable to tell the original cause of the trouble but, in view of the testimony with regard to the circulatory condition—the presence of radial pulse, which indicates that blood is being supplied to the parts, and the movement of the fingers—he believed that when the child left the hospital on March 12 "there had been no serious or permanent interference, and with proper care from then on the condition should have improved, and the patient should have recovered." Dr. McAdams, in his opinion, handled the case well "throughout the treatment of the fracture, both regarding the x-raying of it, the reduction of the fracture, the apposition of the bones, the type of immobilization which was used, and the instructions which were given with regard to the kind of precautions necessary." Dr. Speed saw no objection "if the arm is almost straight to bringing it to right angle position after the splint is applied."

Six other expert witnesses, called on behalf of the plaintiffs, testified that the methods Dr. McAdams used were proper. Dr. Govar, another physician witness called by the plaintiffs, testified that it was optional with the physician whether splints or a cast be used to accomplish immobilization but that he wouldn't deem it advisable to place plaster of paris casts against the skin because "if a person is hairy the hair will join the cast, and if the skin is tender you may get a burn." No physician, said the court, testified for the plaintiffs that direct application of the cast to the skin would be improper from a professional standpoint. Dr. Govar's aversion to plaster of paris was based on the possibility that hairs on the arm might become attached to the cast "and if the skin is tender you may get a burn." There is no testimony in the record that the blisters caused infection or that the deep-seated malady was produced by plaster of paris burns, and Dr. Speed testified that direct application was generally approved. There is no testimony in the record to show that the cast was too tight when first applied. There is testimony that within a short time swelling occurred and that proper treatment probably would have been to loosen the tension. Dr. McAdams cannot be charged with such failure for he had no opportunity to act. The plaintiffs' entire case is predicated on the physician defendants' negligence and want of skill when the operation was performed.

Our conclusion, continued the court, is that the plaintiffs failed to support their allegations with substantial evidence. This is a case in which a layman took chances and experienced misfortune of a tragic nature. If the doctrine res ipsa loquitur applied, the judgments might be sustained. But it does not. Medicine and surgery are inexact sciences, and physicians are not guarantors of results. Our view is that permanent injuries to the child were occasioned by the father's own negligence or error of judgment in not leaving the patient with Dr. McAdams when it became apparent that infection had developed.

The judgments in favor of the plaintiffs were reversed and the causes were dismissed.—*Brown et al. v. Dark (Ark.), 119 S. W. (2d) 529.*

Compensation of Physicians: Liability of Third Person for Medical Fees.—Aileen Yaffe was injured while riding in the automobile of one William Yaffe. After the accident William sent her to a hospital in an ambulance and telephoned the plaintiff, a physician, and employed him to treat her. The plaintiff rendered medical services to the patient for four and one-half months. About two and one-half months after the accident Simon Yaffe, the stepfather of the patient and the father of William, visited the patient at the hospital and at that time had an interview with the plaintiff. The plaintiff claimed that Simon requested him to continue his services and told him to endeavor to get William to pay as much of the bill as he could but that he, Simon, and his wife would be responsible for the bill. Simon, his bookkeeper and his wife, who were present at the interview with the plaintiff, denied that he had made any such agreement. The plaintiff then brought suit against Simon, William and Aileen, the defendants, for $2,750 as payment for his services. As a defense, Simon pleaded that the alleged contract was void under the statute of frauds because it was not in writing. From a judgment in favor of the plaintiff against all the defendants, Simon appealed to the Supreme Court of Arkansas.

The evidence, said the Supreme Court, showed that Simon merely promised the plaintiff that he would take care of the bill if William did not. The undertaking on the part of Simon, therefore, was collateral and not original. It was an undertaking on his part to pay the debt of another if the original debtor failed to pay the same. In the judgment of the court, therefore, the undertaking was within the statute of frauds and, because it was not in writing, was void. Accordingly, the Supreme Court reversed the judgment as to Simon and dismissed the cause as to him.—*Yaffe v. Pickett (Ark.), 121 S. W. (2d) 93.*

Society Proceedings

COMING MEETINGS

American Academy of Pediatrics, Cincinnati, November 16-18. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.
American College of Surgeons, Philadelphia, Oct. 16-20. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.
American Public Health Association, Pittsburgh, Oct. 17-20. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.
American Society of Tropical Medicine, Memphis, Tenn., Nov. 21-24. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.
Association of American Medical Colleges, Cincinnati, Oct. 23-25. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.
Central Association of Obstetricians and Gynecologists, Kansas City, Mo., Nov. 2-4. Dr. W. F. Mengert, University Hospitals, Iowa City, Secretary.
Central Society for Clinical Research, Chicago, Nov. 3-4. Dr. L. D. Thompson, 4932 Maryland Ave., St. Louis, Secretary.
Gulf Coast Clinical Society, Mobile, Ala., Oct. 26-27. Dr. Clyde C. Rouse, 56 St. Joseph St., Mobile, Ala., Secretary.
International Society of Medical Health Officers, Pittsburgh, October 16. Dr. Leon Banov, 12 Mill Street, Charleston, S. C., Secretary.
Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 30-Nov. 3. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.
National Society for the Prevention of Blindness, New York, Oct. 26-28. Mr. Lewis H. Carris, 50 West 50th St., New York, General Director.
New York State Association of Public Health Laboratories, Albany, Nov. 3. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.
Omaha Mid-West Clinical Society, Omaha, Oct. 23-27. Dr. J. D. McCarthy, 107 S. 17th St., Omaha, Secretary.
Pacific Coast Society of Obstetrics and Gynecology, Portland, Ore., Nov. 8-11. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.
Southern Medical Association, Memphis, Tenn., Nov. 21-24. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.
Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
Tri-States Medical Society of Texas, Louisiana and Arkansas, Marshall, Texas, Nov. 8-9. Dr. Robert K. Womack, Longview, Texas, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Obstetrics and Gynecology, St. Louis

38: 187-370 (Aug.) 1939. Partial Index

Treatment of Hemolytic Streptococcus Infections During Pregnancy and Puerperium with Sulfanilamide and Immunotransfusion. C. A. Chandler and C. A. Janeway, Boston.—p. 187.

*Toxemia of Pregnancy: Types, Etiology and Treatment. M. B. Strauss, Boston.—p. 199.

Obstetric Management of Patients with Toxemia. W. J. Dieckmann and I. Brown, Chicago.—p. 214.

*Macrocytic Anemia of Pregnancy and Anemia of Newborn. J. A. Ritter and W. J. Crocker, Philadelphia.—p. 239.

Treatment of Early Abortion. C. E. Galloway and T. D. Paul, Evanston, Ill.—p. 246.

Studies on Reconstruction of Fallopian Tube: Preliminary Report of Original Technic. J. R. Gepfert, New York.—p. 256.

*Treatment of Dysmenorrhea with Testosterone Propionate: Biologic Effects of Testosterone Propionate in Sexually Mature Woman. U. J. Salmon, S. H. Geist and R. I. Walter, New York.—p. 264.

Tubal Sterilization by Madlener Technic. E. von Graff, New York.—p. 295.

Typhoid Fever in Pregnancy: Probable Intra-Uterine Transmission of Disease. A. W. Diddle and R. L. Stephens, Iowa City.—p. 300.

Water Exchange and Salt Balance in Hyperemesis Gravidarum. F. L. McPhail, Great Falls, Mont.—p. 305.

Effect of Temperature on Vitality of Spermatozoa. A. I. Weisman, New York.—p. 313.

*Control of Pain with Local Anesthesia After Repair of Episiotomies. G. W. Hunter, Fargo, N. D.—p. 318.

Severe Menorrhagia as Only Symptom of Essential Thrombocytopenic Purpura Cured by Splenectomy. S. L. Israel and T. H. Mendell, Philadelphia.—p. 339.

Interstitial Pregnancy Following Salpingectomy. I. Forman, Philadelphia.—p. 344.

Interstitial Pregnancy: Five Months' Gestation, with Observation of Phenomenon of Rupture at Time of Operation. A. J. Kobak, Chicago.—p. 346.

Neglected Sign for Roentgenologic Diagnosis of Intra-Abdominal Dermoid Cyst. G. Danelius, Chicago.—p. 348.

Toxemia of Pregnancy.—Strauss declares that the term "toxemia of pregnancy" has served for generations and still serves as a diagnostic waste basket to cloak ignorance. Medical prepossession with mysterious and unidentified "toxins" has prevented intelligent study of the various disorders combined under this misnomer. Writers have wisely refrained from defining what toxemia is. To each the word carries certain connotations; rarely does it mean quite the same thing to any two. There remains one simple method of dividing this heterogeneous group of "toxemic" women into at least two main classes, and that is by studying the state of affairs antecedent and subsequent to the "toxemia." Such study reveals that about 80 per cent of the women designated as having "toxemia" actually have chronic vascular or renal disease before and after the gravid state, and an additional 5 per cent have such disease in acute form. The remaining 15 per cent of such women have had no demonstrable abnormality before pregnancy or after the pregnancy in which abnormalities called "toxemia" occurred. Further, these women under proper management will have subsequent uneventful pregnancies. It is this group for which the designation "water-retention toxemia" seems appropriate. A low sodium intake is one means of eliminating undue water retention. The development of water-retention toxemia may be prevented by maintaining the pregnant woman's plasma proteins at a normal level by an adequate diet and avoiding excessive sodium ingestion.

Macrocytic Anemia of Pregnancy and of Newborn.—Ritter and Crocker studied the relationship between anemia of the newborn and the hematologic picture in the mother and believe that the anemia of both the mother and the infant is due to a dietary deficiency. Only one case has been encountered in the maternity service of the Philadelphia General Hospital. The response of the mother to liver therapy was inadequate and her severe reactions to transfusions precluded their further use. The reticulocyte response was poor both during pregnancy and after parturition. Therefore, either a specific need for the liver was not indicated or an inadequate dose or an impotent extract was used. Nevertheless the mother did improve after delivery, when there was a cessation of vomiting and diarrhea and better utilization of a balanced diet. The deficiency factor which produced the anemia in the mother may possibly have been likewise deficient in the infant. It appeared that the maturation of the erythron was arrested at a fetal level because of the infant's inability to utilize a factor which it could not obtain in utero. In fact, there appears to have been little response to combined therapy and transfusions seemed only to carry the infant over until such a time as its own erythropoietic system could function at a more mature level. The infant's reticulocyte response was definitely poor in spite of marked anemia. Once a higher level of maturation of the infant's red blood cells was attained, probably conditioned by dietary intake of the deficient factor, steady improvement was noted. Oddly enough there was not an "adequate" reticulocyte response in the recovery phase. The authors can only say that the erythropoietic system was either depressed or inhibited in some inexplainable manner and improvement occurred only when this was overcome. Why such factors should work selectively on the erythropoietic system does not seem explainable except by some mechanism such as produces pernicious anemia in adults.

Treatment of Dysmenorrhea with Testosterone Propionate.—Salmon and his associates used testosterone propionate in the treatment of thirty women suffering from dysmenorrhea. The level of testosterone tolerance was established at approximately 500 mg. Administration of upward of 500 mg. resulted in the appearance, in some of the cases, of masculinization phenomena and evidence of estrogen deficiency. Normal cyclic phenomena (clinical and morphologic) returned spontaneously in all cases within two months after treatment. With doses of 300 mg. or less neither androgenic nor estrogenic deficiency effects were produced. Symptomatic relief of twenty-six of the thirty women was achieved. The suggestion is made that the biologic effects of testosterone propionate (in doses of 500 mg. or more) in women is brought about by inhibition of the gonadotropic factors of the hypophysis with consequent suppression of ovulation, estrogen and progesterone formation and menstruation, as well as by inactivation of the circulating estrogens and estrogen stores in the body. The therapeutic effects of smaller doses are probably the result of partial inactivation or modification of the action of the estrogens and progesterone. The theory is advanced that functional dysmenorrhea may be caused by an androgen deficiency.

Local Anesthesia for Pain of Episiotomies.—Reports of the successful use of soluble anesthetic solutions in rectal surgery with the purpose of relieving patients from postoperative pain have suggested to Hunter the use of this type of medication following episiotomy and other perineal repair. The results with twenty-five patients and twenty-five alternate patients taken as controls were encouraging. Two types of solutions were used: procaine base 1.5 per cent, butesin 6 per cent, benzyl alcohol 5 per cent and oil of sweet almond, the other solution being an aqueous one containing 1 per cent piperidinopropanedio diphenylurethane hydrochloride. Following repair of the episiotomy or perineal laceration, 10 cc. of warmed solution is drawn into a dry Luer Lok syringe. The solution is injected slowly into the deeper tissue, care being taken that it does not go immediately beneath the skin or mucous membranes. Following injection, massage of the parts assures an even distribution of the anesthetic. The needle is inserted about one-fourth inch on each side of the incision and the solution is injected fanwise. The injection is made while the patient is still under the effects of the general anesthetic given during repair. The water soluble solution was used for ten patients and they were free from pain until the third or fourth postpartum day, at which time the effects of the anesthesia had apparently disappeared. They then experienced as much pain as the controls. The oil soluble anesthetic, however, kept patients for the most part entirely free from distress. Healing did not appear to be impaired and no general toxic effects were observed.

American Journal of Public Health, New York

29: 821-982 (Aug.) 1939. Partial Index

Care of Premature Infants. Ethel C. Dunham, Washington, D. C.—p. 847.
Effectiveness of Different Systems of Collecting Vital Statistics Data. J. V. DePorte, Albany, N. Y.—p. 856.
Infection of Air: Bacteriologic and Epidemiologic Factors. W. F. Wells, M. W. Wells and S. Mudd, Philadelphia.—p. 863.
*Paratyphoid Fever in Massachusetts. R. F. Feemster and G. W. Anderson, Boston.—p. 881.
Relation of Coroner's Office to the Bureau of Vital Statistics. S. R. Gerber, Cleveland.—p. 889.
Analysis of Subsequent Course of Diagnosed Cases of Tuberculosis. Ruth R. Puffer, H. C. Stewart and R. S. Gass, Nashville, Tenn.—p. 894.
Effects on Health of Gases Produced by Electric Arc. L. W. La Towsky, Philadelphia.—p. 912.
Comparative Study of Mouse and Guinea Pig Inoculation Methods in Diagnosis of Rabies. S. E. Sulkin and J. C. Willett, St. Louis.—p. 921.
San Francisco's Hotels Are Examined for Cross Connections. J. C. Geiger, A. B. Crowley and G. E. Arnold, San Francisco.—p. 927.

Paratyphoid Fever in Massachusetts. — Feemster and Anderson state that a sudden increase in paratyphoid fever occurred in Massachusetts in 1937. From a level of about six cases a year the number reported rose to 267. The cases reported in 1937 fall readily into five groups. There were four food-borne outbreaks (220 cases), and the remainder (forty-seven) were sporadic cases; these occurred before the outbreaks and were widely scattered throughout the state. It has been impossible to trace any connection between these outbreaks. People infected in the first outbreak may have carried the organism to many other parts of the state, but so far no such individuals have been found. The fact that twenty with positive stools and eleven others with positive agglutination tests were entirely without symptoms emphasizes the importance of subclinical infections in this disease and illustrates why its control may be difficult. The persistence of the organism in the stools of convalescents adds an additional problem. Almost half of those who showed positive stools were still carrying the organism at the end of five weeks, one eighth at the end of nine weeks and others continued positive until the twenty-eighth, thirty-second and forty-ninth weeks and there were five permanent carriers. In the first nine months of 1938, sixty-six cases were reported. Six small outbreaks, forty-eight cases, occurred in families or in groups eating a common meal. The other eighteen cases were sporadic.

Archives of Dermatology and Syphilology, Chicago

40: 345-520 (Sept.) 1939

Factor Analysis of Acne Complex with Therapeutic Comment. J. H. Stokes, Philadelphia, and T. H. Sternberg, Peoria, Ill.—p. 345.
Management of Intractable Urticaria. E. F. Traut, Chicago.—p. 368.
Nodular Myxedema Complicating Thyrotoxicosis: Report of Case. F. Handley and J. G. Downing, Chelsea, Mass.—p. 374.
*Pigmentation Following Use of Iron Salts. C. E. Reyner, Detroit.—p. 380.
Staphylococcus Ambotoxoid: Experience with Its Use in Treatment of Acne Vulgaris and Other Pyogenic Dermatoses. L. E. Anderson, Springfield, Mass., and J. H. Stokes, Philadelphia.—p. 382.
Multiple Pigmented Nevi: Report of Case. H. L. Arnold Jr., Ann Arbor, Mich.—p. 386.
Hemosiderin Histiocytoma of Skin. J. C. Bernstein, Baltimore.—p. 390.
*Mouse Brain Antigen: Intravenous Use in Diagnosis of Lymphogranuloma Venereum. D. A. Decker, Allentown, Pa.; O. Cañizares and R. F. Reider, New York.—p. 397.
Recurrent Herpetiform Dermatitis Repens. S. Ayres Jr. and N. P. Anderson, Los Angeles.—p. 402.
Dermatitis Due to Sulfur-Meat Complex: Report of Case. J. C. Bernstein, Baltimore.—p. 414.
Patterned Alopecia About Calves and Its Apparent Lack of Significance. F. Ronchese and R. R. Chace, Providence, R. I.—p. 416.
Epidermodysplasia Verruciformis (Lewandowsky and Lutz). M. Sullivan and F. A. Ellis, Baltimore.—p. 422.

Pigmentation Following Use of Iron Salts. — Reyner reviews the reports of the eight cases of (permanent) pigmentation from the use of iron salts in the treatment of ivy poisoning. He cites an additional case of pigmentation in which complete removal of the iron deposits was effected by ultraviolet irradiation (with a water-cooled lamp). Heretofore such pigmentation has been considered permanent.

Diagnosis of Venereal Lymphogranuloma.—Decker and his associates find that the intravenous injection of 0.1 cc. of mouse brain antigen is a reliable procedure for corroborating the results of the intradermal Frei test in the diagnosis of venereal lymphogranuloma. When they injected 0.1 cc. of mouse brain antigen into thirty-five patients with venereal lymphogranuloma of the inguinal type, thirty gave a positive and five a doubtful reaction. All twenty-one patients with venereal lymphogranuloma of the genitorectal type gave a positive reaction. Of seventy control subjects given an injection of 0.1 cc. of mouse brain antigen, five gave a doubtful and the rest a negative reaction. A patient who had had a bubo of venereal lymphogranuloma incised four years before and had apparently had no recurrence gave a typical reaction to the intravenous injection of 0.1 cc. of Frei antigen (mouse brain) intravenously. This would support the view that the reaction to intravenous injection behaves similarly to that to intradermal injection, remaining positive after active signs of the disease are no longer present.

California and Western Medicine, San Francisco

51: 73-144 (Aug.) 1939

Sulfanilamide and Sulfapyridine in Treatment of Various Infections. C. S. Keefer, Boston.—p. 81.
Congenital Malformations of Rectum and Anus: Their Surgical Treatment. L. R. Chandler, San Francisco.—p. 84.
The Patient's Concept of Maternity Care as Obtained from Popular Sources. G. W. Coon, Riverside.—p. 92.
Present Status of Artificial Fever in Treatment of Syphilis. N. N. Epstein, San Francisco.—p. 94.
Santiago Ramón y Cajal. J. B. Doyle, Los Angeles.—p. 97.
Cure of Gonorrhea: Immunologic Problem. E. W. Beach, Sacramento.—p. 100.
*Herpes Zoster: Treatment with Thiamin Chloride. M. J. Goodman, Eureka.—p. 105.

Thiamin Chloride for Herpes Zoster.—Since the beneficial influence of thiamin chloride in neuritis and its prevention of certain degenerative nerve changes is acknowledged, and since it has been established that the prominent feature in herpes zoster is a neuritis with degenerative changes, Goodman treated five such cases with subcutaneous administration of thiamin chloride with gratifying results. In comparing the results obtained in these cases with similar ones treated by local applications and salicylates the author finds that the former treatment is a logical and more satisfactory means of combating herpes zoster. The pain is relieved more promptly, the lesions clear up at an earlier date and the total disability time is notably decreased. In one instance a longer period (than six or seven injections of 3,000 units of thiamin chloride daily or every other day) of treatment was required. The age (71) of the patient may have been a factor. The results obtained suggest that further investigation in this field is warranted.

Canadian Medical Association Journal, Montreal

41: 111-222 (Aug.) 1939. Partial Index

*Use of Vitamin K and Bile Salts in Prevention and Control of Hemorrhagic Diathesis in Obstructive Jaundice. Preliminary Report. S. R. Townsend and E. S. Mills, Montreal.—p. 111.
Menorrhagia, with Special Reference to Occult Hyperthyroidism. E. V. Shute, London, Ont.—p. 115.
*Intestinal Protozoa of Man in Saskatchewan. M. J. Miller, New Orleans.—p. 120.
Surgical Procedures in Pulmonary Tuberculosis. A. J. Grace, London, Ont.—p. 124.
Appendicitis. G. Murray, Toronto.—p. 134.
Relative Value of Different Essential Phases in White Cell and Differential Count in Diagnosis of Appendicitis. F. Smith, Kelowna, B. C.—p. 138.
Use of Fascia Lata in Treatment of Fallen Metatarsal Arches. E. E. Shouldice, Toronto.—p. 142.
Human Electro-Encephalogram and Its Clinical Significance. J. E. Goodwin and G. E. Hall, Toronto.—p. 146.
Early Diagnosis of Expanding Lesions of Brain. L. H. McConnell, Saskatoon, Sask.—p. 151.
External Hydrocephalus. A. E. Harbeson, Kingston, Ont.—p. 158.
Rare Cause of Fatal Hematemesis. R. D. Roach, Moncton, N. B.—p. 173.
Relation of Achlorhydria to Nutritional Anemia of Children. R. Wilson, Vancouver, B. C.—p. 176.
Significance of Indigo, Cyanogen and Thiocyanate in Tumor Cases. J. E. Davis and H. E. Schmitz, Chicago.—p. 178.

Vitamin K and Bile Salts for Hemorrhagic Diathesis.—Ten cases of obstructive jaundice are presented by Townsend and Mills in which the plasma prothrombin levels were low and in which there was an abnormal tendency to bleed, as indicated by prolonged clotting times. Administration of vitamin K

and bile salts restored the clotting time to normal. One failure with no adequate explanation is recorded. No abnormal bleeding followed operation on patients treated with vitamin K and bile salts. In one case there was a further disturbance in the plasma prothrombin after operation with an abnormal tendency to bleed. Prophylactic therapy is suggested as a safeguard. It is suggested that the tendency to give patients with jaundice a low fat diet predisposes to K avitaminosis, which may be accentuated further by the frequently accompanying nausea and vomiting.

Intestinal Protozoa of Man.—As information regarding the incidence of intestinal parasitic infection in Canada is lacking, Miller obtained data on the incidence of such infection in Saskatoon, Sask., by examining the stools of 254 persons. Ninety-seven of these, or 38.2 per cent, were positive for intestinal parasites. Only protozoan parasites were found. No helminth eggs were recovered from the stools, although one immature Ascaris, passed by a 6 year old child, was sent in by a local physician. Seven species of Protozoa were found. Five of these belonged to the class Rhizopoda and the two remaining species belonged to the class Mastigophora. Of the 254 stools examined 149 were from hospitalized and nonhospitalized clinical patients, forty of whom, or 26.8 per cent, showed parasitic infections. Only five of the infected persons harbored more than one parasite, and these were all double infections. An infection incidence of 39.7 per cent was obtained in a group of fifty-eight healthy persons. Multiple infections were found in two persons. In forty-seven orphan asylum children the incidence of parasitic infections was approximately 72 per cent. Multiple infections were quite common in this group, and of the thirty-four infected children eight had triple infections, eleven had double infections and the remaining fifteen harbored only one species. Endamoeba coli was found most often in all three groups. In the orphans this was followed by Endolimax nana, then Endamoeba histolytica. The observations of Fantham and Porter together with the present results, the author states, tend to demonstrate that parasitic infection is widespread throughout Canada and that even climates as severe as those found in western Canada are tolerated by this parasite. Therefore competent stool examinations should play an important part in diagnosing otherwise unexplained diseases of the large intestine.

Florida Medical Association Journal, Jacksonville

26: 57-108 (Aug.) 1939

Puerperal Infection versus the General Practitioner. W. C. Roberts, Panama City—p. 67.
Five Hundred Consecutive Major Operative Gynecologic and Obstetric Cases. F. Richards, Jacksonville.—p. 72.
Menace of State Medicine. R. F. Godard, Quincy.—p. 77.
Jellyfish and Portuguese Man-of-War Stings. E. J. Thomas, Miami Beach.—p. 83.
Present Status of Cancer Therapy. E. M. Hendricks, Fort Lauderdale.—p. 87.
Relation of Sympathetic Nervous System to Health and Longevity. T. M. Rivers, Kissimmee.—p. 90.

Journal of Immunology, Baltimore

37: 85-178 (Aug.) 1939

Studies on Serum Complement of Guinea Pigs Infected with Trypanosoma Equiperdum. I. Horner, Pecs, Hungary.—p. 85.
Gonadotropic Inhibitory Substance and Precipitins in Blood of Monkeys Receiving Gonadotropic Hormone Preparations. R. K. Meyer and H. R. Wolfe, Madison, Wis.—p. 91.
Simplified Formula for Diphtheric Toxin Broth. J. H. Mueller, Boston.—p. 103.
Effect of Hypophysectomy on Immunity and Hypersensitivity in Rats with Brief Description of Operative Technic. N. Molomut, New York.—p. 113.
Disintegration of Bacteria by Mechanical Means: I and II. P. H. Langner Jr. and J. S. Forrester, Philadelphia.—p. 133.
Id.: III. Comparative Reactions After Intracutaneous Injection of Filtrates of Mechanically Disintegrated Bacteria and of Heat Killed Whole Organism Suspensions. J. S. Forrester and P. H. Langner Jr., Philadelphia.—p. 141.
Antigenic Structure of Hemolytic Streptococci of Lancefield Group A: V. Lack of Interference of Blood Group A Substance in Culture Mediums with Chemical and Serologic Studies on Streptococcus Haemolyticus. W. Henle and Gertrude Henle, Philadelphia.—p. 149.
Group Specific Agglutinins in Rabbit Serums for Human Cells: VI. Immune Specific M Agglutinins. K. M. Wheeler, P. B. Sawin and C. A. Stuart, Providence, R. I.—p. 159.
M Agglutinogen of Rhesus Monkeys. K. M. Wheeler and C. A. Stuart, Providence, R. I.—p. 169.

Journal of Investigative Dermatology, Baltimore

2: 151-230 (Aug.) 1939

Clinical and Experimental Study of Interstitial Keratitis. J. V. Klauder, with assistance of E. R. Gross and H. F. Robertson, Philadelphia.—p. 157.
Notes on Anatomy and Pathology of Skin Appendages: I. Wall of Intra-Epidermal Part of Sweat Duct. H. Pinkus, Eloise, Mich.—p. 175.
Cultural Characteristics of Pityrosporum Ovale: Lipophylic Fungus. Rhoda W. Benham, New York.—p. 187.
*Further Studies on Therapy of Acne Vulgaris with Modified Liver Extract. W. Marshall, Appleton, Wis.—p. 205.
Experimental Use of Lipocaic in Treatment of Psoriasis: Preliminary Report. C. D. Stewart, D. E. Clark, L. R. Dragstedt and S. W. Becker, Chicago.—p. 219.

Liver Extract for Acne Vulgaris.—Marshall used boiled liver extract in the treatment of fourteen cases of acne vulgaris and obtained satisfactory results. The subcutaneous injection of liver extract, 0.4 cc., is given so that a sufficient amount of the probably specific vitamin (probably vitamin H, termed the X factor by Boas and the skin factor by Gyorgyi) may be had. The author says this reservedly, although he is not acquainted with any other material in the extract which would increase its dermatologic potency on boiling. Since the seborrhea seemed to be the first component of the acne complex to improve, it appears that one may be dealing with a human counterpart of status seborrhoeicus in experimental animals. When injectable liver extract is boiled for thirty minutes, its acne-improving factor seems to increase. When this boiled extract is given to patients already under routine liver therapy, their improvement appears more rapid.

Journal of Nutrition, Philadelphia

18: 105-216 (Aug.) 1939

Vitamin B1 Content of Human Milk as Affected by Ingestion of Thiamin Chloride. Agnes Fay Morgan and Edna Gavin Haynes, Berkeley, Calif.—p. 105.
Comparative Toxicity of Fluorine in Calcium Fluoride and in Cryolite. Margaret Lawrenz, H. H. Mitchell and W. A. Ruth, Urbana, Ill.—p. 115.
Comparison of Toxicity of Fluorine in Form of Cryolite Administered in Water and in Food. Margaret Lawrenz, H. H. Mitchell and W. A. Ruth, Urbana, Ill.—p. 127.
*Average Values for Basal Respiratory Functions in Adolescents and Adults. N. W. Shock and M. H. Soley, Berkeley, Calif.—p. 143.
Dietary Requirements of Guinea Pig, with Reference to Need for a Special Factor. M. D. Cannon and Gladys A. Emerson, Berkeley, Calif.—p. 155.
Minimal Vitamin A and Carotene Requirement of Rat. H. Goss and H. R. Guilbert, Davis, Calif.—p. 169.
Conditions Affecting Content of Chick Antidermatitis Vitamin in Yeast. W. H. Peterson and C. A. Elvehjem, Madison, Wis.—p. 181.
Influence of Massive Doses of Vitamin B1 on Fertility and Lactation. B. Sure, Fayetteville, Ark.—p. 187.
Basal Metabolism of Connecticut State College Students. E. Charlotte Rogers, Storrs, Conn.—p. 195.

Average Basal Respiratory Functions.—In an attempt to determine the range in values of basal respiratory functions in normal adolescents and adults and to indicate changes that take place during adolescence, Shock and Soley recorded the respiratory rate, the respiratory volume per minute, the tidal volume, the concentration of oxygen and carbon dioxide in the expired air, the oxygen consumption and the alveolar carbon dioxide tension of fifty normal boys, fifty normal girls, forty-six normal adult men and forty normal adult women. In the children the tests were begun at the ages of 11 or 12 years and were repeated at intervals of six months over a period of five years. The adults ranged in age from 27 to 43 years. The adults were chosen from staff members and from university students who were presumably healthy (although no systematic medical examination was given) and in view of their sedentary activities the average values for metabolic tests may be somewhat lower than for the general population. In the adult group as many as sixty tests were made in triplicate only on two successive days on each subject. The authors tabulate the results of these studies and in conclusion state that the following was found to prevail: 1. In boys the minute respiratory volume increases between the ages of 12 and 14 years, owing to an increase in body size. 2. In boys the respiratory rate decreases between the ages of 14 and 16, the tidal volume increases, the concentration of oxygen in the expired air decreases and the expired carbon dioxide increases. 3. In girls the respiratory volume and tidal volume increase between the ages of 12 and 14 years. 4. The composition of the expired air in girls changes between the ages of 14 and 16 as it does in the boys,

but the change is not so clearly defined. In boys there is a significant increase in alveolar carbon dioxide tension between the ages of 12 and 14 years. No significant change in alveolar carbon dioxide tension was found in girls. 5. The average oxygen consumption per minute increases from the age of 12 to 16 years in both sexes. In respect to body size there is a decrease in oxygen consumption. 6. Most respiratory functions of girls of 16 are similar to those of adult women. 7. Sixteen year old boys breathe more rapidly and have a smaller tidal volume, higher concentration of oxygen and lower concentration of carbon dioxide in the expired air and a lower total oxygen consumption than adult men.

Journal of Pharmacology & Exper. Therap., Baltimore

66: 379-508 (Aug.) 1939. Partial Index

Effects of Various Agents on Metabolic Rate in Experimental Hyperthyroidism. W. C. Cutting and G. B. Robson, San Francisco.—p. 389.
Role of Molecular Oxygen in Antispirochetal Activity of Arsenic and Bismuth Compounds in Vitro. H. Eagle, Baltimore.—p. 423.
Effect of Sulfhydryl Compounds on Antispirochetal Action of Arsenic, Bismuth and Mercury Compounds in Vitro. H. Eagle, Baltimore.—p. 436.
Comparison of Actions of Prostigmine and of Guanidine on Activity of Choline Esterase in Blood Serum. Ann S. Minot, Nashville, Tenn.—p. 453.
Action of Syntropan on Gastrointestinal Tract. B. B. Clark, E. B. S. Shires Jr., E. H. Campbell and C. S. Welch, Albany, N. Y.—p. 464.
*Studies in Absorption, Distribution and Elimination of Alcohol: IV. Elimination of Methyl Alcohol. H. W. Haggard and L. A. Greenberg, New Haven, Conn.—p. 479.

Elimination of Methyl Alcohol.—Widmark is of the opinion that methyl alcohol is largely destroyed in the body and that the loss is at a uniform rate regardless of the amount present or the concentration in the blood. Haggard and Greenberg, to the contrary, state in summary that they find that: 1. More than 70 per cent of the methyl alcohol is eliminated in the expired air. 2. The elimination follows the principle defined for volatile substances which are largely nonreactive. 3. The amount eliminated in unit time is determined by the concentration of alcohol in the blood and the volume of pulmonary ventilation. 4. The curve obtained from the concentrations of methyl alcohol in the blood during elimination is not a straight line but an exponential curve. 5. The Widmark value β held by him to be a constant is not a constant but a variable influenced by all factors which influence the amount of methyl alcohol eliminated in unit time in the expired air.

Journal of Thoracic Surgery, St. Louis

8: 581-696 (Aug.) 1939

Disease of Aberrant Intrathoracic Lung Tissue. S. O. Freedlander and P. W. Gebauer, Cleveland.—p. 581.
Beck Operation (Heart): Report of Two Cases. A. L. Lockwood, Toronto.—p. 598.
Treatment of Pulmonary Tuberculosis by Temporary Elimination of Number of Intercostal Nerves. F. Torek, New York.—p. 607.
Patient Support for Thoracoplasties and Other Thoracic Operations. W. L. Howard, Battle Creek, Mich.—p. 613.
Partial Thoracoplasty (with Extrafascial Apicolysis) and Contralateral Oleothorax. A. H. Aufses, New York.—p. 615.
Extrapleural Apicolysis. A. R. Judd, Glen Gardner, N. J.—p. 622.
Thoracoplastic Collapse of Acute Progressive Tuberculosis: Report of Five Cases. H. Meltzer, Ninette, Man.—p. 627.
Immediate Effect of Scaleniotomy on Size of Apical Tuberculous Cavities. J. H. Gibbon Jr., Philadelphia.—p. 633.
Interposition of Colon Following Right Phrenic Nerve Interruption. C. Muschenheim and J. B. Amberson Jr., New York.—p. 638.
*New Technic for Phrenic Crush. L. W. Frank, Louisville, Ky.—p. 644.
Technic of Extrapleural Pneumothorax. F. S. Dolley, J. C. Jones, Los Angeles, and Jane Skillen, Olive View, Calif.—p. 646.
Penetrating Gunshot and Stab Wounds of Thorax: Report of Eighty-Seven Cases. C. R. Steinke, Akron, Ohio.—p. 658.
Gunshot Wound of Chest of Patient with Artificial Pneumothorax. E. F. Parker Jr., Nashville, Tenn.—p. 666.
Experimental Lobectomy Using Bronchial Plugs. S. R. Rosenthal, E. H. Lambert, W. Van Hazel and P. H. Holinger, Chicago.—p. 668.
Catheter for Bronchospirometry. P. W. Gebauer, Cleveland.—p. 674.
Bronchiogenic Carcinoma of More Than Five Years' Duration Treated by Radiotherapy: Report of Case. F. R. Harper, Denver.—p. 683.

Phrenic Crush.—Frank states that, after crushing of the main phrenic nerve for 1 cm., resection of large segments of any accessory nerves and division of the nerve to the subclavius muscle, only 50 per cent of his cases were successful as evidenced by a total paralysis of the diaphragm. Of the 50 per cent which were unsatisfactory, half showed only partial paralysis of the diaphragm; in the others an apparent paralysis was first produced and diaphragmatic movement became reestablished in an average time of three months. As all the operations had been most carefully done, it became evident that other connections entering the phrenic nerve below the clavicle must exist. Therefore the author developed the following technic: The usual transverse incision for exposure of the phrenic nerve is employed. The accessory phrenic nerves are divided. The nerve to the subclavius muscle is resectioned as before. The phrenic nerve is then crushed for approximately 1 cm. and drawn upward into the neck for from 3.5 to 4 cm. It was thought that, by drawing the nerve upward, any filaments entering the phrenic nerve below the clavicle might be torn and hence the resulting paralysis of the diaphragm would last a much longer time. The incision is closed with subcuticular suture of fine silk with a split shot on each end of it. Since January 1935 the author has performed the foregoing operation on 246 patients and in every one complete paralysis of the diaphragm ensued. Following this type of operation the diaphragm remained paralyzed on an average of from ten to twelve months. Diaphragmatic movement then began, although that structure itself remained elevated. The amount of diaphragmatic excursion increased, and within from two to three months the diaphragm returned to its normal position and full normal respiratory movement.

Kansas Medical Society Journal, Topeka

40: 317-360 (Aug.) 1939

What the General Practitioner Should Know About Ear, Nose and Throat Diseases. L. J. Birsner, St. Louis.—p. 317.
Newer Knowledge of Central Vegetative Nervous System. R. R. Grinker, Chicago.—p. 321.
*Recovery from Subacute Infectious Endocarditis. R. H. Major and L. H. Leger, Kansas City, Mo.—p. 324.
Dermatitis Venenata: Practical Aspects and Innocuous Treatment. R. L. Sutton Jr., Kansas City, Mo.—p. 325.
Treatment of Actinomycosis with Sulfanilamide: Report of Two Cases. M. T. Sudler and C. B. Johnson, Lawrence.—p. 330.
Coarctation of Aorta: Case Report. E. R. Schwartz, Manhattan, and G. M. Tice, Kansas City.—p. 330.
A County-Wide High School Tuberculin Testing Plan. R. R. Melton, Marion, and W. M. Tate, Peabody.—p. 332.

Recovery from Subacute Infectious Endocarditis.—Major and Leger report their second case of subacute infectious endocarditis in which recovery occurred following sulfanilamide and sulfapyridine therapy. It must be kept in mind that occasionally patients with subacute infectious endocarditis recover spontaneously. However, the authors feel that in this instance, as in the previous one, recovery was due to the therapy employed. Also in both patients the relatively short duration of the illness was probably a decisive factor.

Medical Annals of District of Columbia, Washington

8: 223-254 (Aug.) 1939

Supervised Obstetrics in a General Hospital: Review of Obstetrics, Garfield Memorial Hospital, 1938. R. B. Nelson Jr., Washington.—p. 223.
Therapeutic Use of Iodized Oil in Chronic Bronchitis and Bronchiectasis. W. D. Tewksbury and E. R. Fenton, Washington.—p. 227.
African Sleeping Sickness: Comparison with Dementia Paralytica and with Epidemic Encephalitis. E. de Savitsch and W. Freeman, Washington.—p. 231.
Benign Paranoid Reactions. E. Klein, Washington.—p. 235.
Argentaffinoma of Ileum: Report of Case. J. O. Warfield Jr., Washington.—p. 242.

Michigan State Medical Society Journal, Lansing

38: 645-740 (Aug.) 1939

Pioneer Sanitarians in Michigan. E. E. Kleinschmidt, Ann Arbor.—p. 659.
*Incidence of Idiopathic Hypertension in the Young. Frances L. MacCraken, Detroit.—p. 668.
Specific Therapy of Pneumonias: II. Serum Therapy of Pneumonias. J. G. M. Bullowa, New York.—p. 670.

Idiopathic Hypertension in the Young.—MacCraken wonders whether the tendency on the part of the physician to regard malignant or idiopathic hypertension as a disease of the forties may not be due to the fact that blood pressures of younger persons are taken infrequently. In other words, as one becomes older intercurrent conditions arise or symptoms develop which take one to the physician for the express purpose of "having the blood pressure taken." This hypertension is then discovered and attributed to the age of the patient, whereas an earlier examination might possibly have at least disclosed a beginning hypertension of less severity. In the

consideration of this phenomenon, as an examiner for more than 10,000 women between the ages of 20 and 30 applying for positions as teachers, the author observed among other things a distinct variation in blood pressure. While the blood pressure of most of the women ranged around 120 mm. of mercury systolic and less, about one in twenty showed a rise of from 20 to 30 mm. or more. These rises in systolic pressure were not psychic as a rule but rather persistent over a series of tests. In only about 0.1 per cent was any causative factor isolated, though in each case a careful urinalysis was made and further tests when possible. In the 500 cases only meager histories and routine examinations were obtained. Only twenty returned for reexamination following illness or some other form of leave of absence but these consistently showed the total absence of symptoms and gradual increase in tension. The absence of any "follow-up" in the majority of these cases lowers the value of the information, but the author believes that the presence of this factor in so many otherwise normal persons opens a field for conjecture and investigation.

New Orleans Medical and Surgical Journal

92: 61-112 (Aug.) 1939

Unification of Medical Profession for Protection of the Public. L. J. Menville, New Orleans.—p. 61.
Present Concept of Cancer. J. T. Nix, New Orleans.—p. 65.
Metrazol Therapy in Psychotic Excitements. E. N. Carmouche, S. J. Phillips, Pineville, La., and D. H. Duncan, Shreveport, La.—p. 67.
Pneumococcic Pneumonia: Treatment with Type Specific Serum. C. D. Head Jr., New Orleans.—p. 73.
Theophylline Ethylenediamine (Aminophyllin) in Bronchial Asthma. B. G. Efron and P. Everett, New Orleans.—p. 77.
Methods Used in Induction of Labor. M. B. Pearce, Alexandria, La. —p. 79.
Undulant Fever: A Problem in Every Physician's Practice. W. H. Browning and J. S. Shavin, Shreveport, La.—p. 81.
Trigeminal Neuralgia. D. H. Echols, New Orleans.—p. 87.
Fractures of Malar Bone and Zygoma with Eye, Ear, Nose and Throat Complications. M. F. Meyer, New Orleans.—p. 90.
Aneurysm of Splenic Artery: Report of Case, with Special Reference to Certain Aids in Diagnosis. J. G. Pasternack and J. R. Shaw, New Orleans.—p. 94.

New York State Journal of Medicine, New York

39: 1525-1636 (Aug. 15) 1939

Compensation for Eye Injuries: Its Past, Present and Future in New York State. A. C. Snell, Rochester.—p. 1531.
Rationale and Results of Maggot Therapy in Chronic Osteomyelitis. J. Buchman, New York.—p. 1540.
Acute Osteomyelitis. C. T. Harris, Rochester.—p. 1554.
*Sulfapyridine in Treatment of Pneumonia: Report of 100 Cases. B. R. Allison, Hewlett.—p. 1558.
Newer Concepts of Bacillary Dysentery and Other Types of Intestinal Infection. J. Felsen, New York.—p. 1562.
Treatment of Varicose Veins and Varicose Ulcers: Experiences in 800 Cases. P. H. Rakov, Syracuse.—p. 1569.
Diarrheal Diseases: Report of Findings in 220 Consecutive Cases. W. Z. Fradkin, Brooklyn.—p. 1578.
Microsedimeter for Erythrocyte Sedimentation Test. H. Vollmer, New York.—p. 1583.
Renal Sympathectomy. J. S. Ritter and L. A. Shifrin, New York.—p. 1587.
Pilonidal Sinus and Its Treatment. I. Silverman, Brooklyn.—p. 1598.
Carcinoma of Bladder: Open Surgical Treatment. A. Harris, Brooklyn. —p. 1603.
Meningococcic Meningitis: Treatment of Case with Meningococcus Antitoxin. A. M. Tunick and A. A. Goldbloom, New York.—p. 1608.
Skin Reactions: VIII. Treatment of Hay Fever Coseasonally by Electrophoresis of Active Constituent of Ragweed Extract: Preliminary Report. H. A. Abramson, New York.—p. 1611.
Jejunal Carcinoma: Report of Case. W. W. Jetter, Taunton, Mass.—p. 1614.
Coronary Occlusion in Young Adults: Review of Literature with Report of Case Aged 26. A. S. Ferguson, Newburgh, and J. R. Lockwood, Highland.—p. 1618.
Tonsillectomy in the Diabetic Child. A. H. Terry Jr., New York.—p. 1622.

Sulfapyridine for Pneumonia.—Since January 1939, Allison points out, 100 cases of pneumonia have been treated at the Nassau Hospital. Every patient with pneumonia admitted to the hospital was given sulfapyridine whether or not a pneumococcus was found in the sputum. If a patient was desperately sick on admission or did not respond promptly to the drug, serum also was given. The sputum was examined at least once in ninety-seven cases. A pneumococcus was found in seventy, and twenty-seven were negative for pneumococci. The types of pneumococci found were I, III to VIII, XI, XIV to XXIII, XXVIII and XXIX. Blood counts and urinalyses were done in all cases. The severity of illness of these 100 patients was comparable to any similar series of patients with pneumonia admitted to the hospital during recent years. Sixty-one patients were admitted before the fourth day of the disease, twenty on the fourth day and nineteen after the fourth day. Forty-two cases occurred in children less than 10 years of age, nine of these occurring during the first year. The average number of days spent in the hospital was 13.8. Four of the 100 patients died, one infant and three adults. Six of the seventy blood cultures performed were positive; three were type I, two type VIII and one was unidentified. One of the patients with type I pneumococci, with a very heavy growth, was addicted to alcohol, had hypertension and made a dramatic recovery. One, with a heavy growth, died in twenty-four hours in spite of 400,000 units of serum and sulfapyridine. The third patient recovered after 300,000 units of serum and 46 Gm. of the drug. Both patients with type III pneumococcus recovered. The unidentified case also resulted in recovery. An initial dose of 2 Gm. of the drug followed by 1 Gm. every four hours was given in most of the adult cases. Of the fifty-eight adults, twenty-eight received a total of less than 15 Gm., fifteen received from 15 to 25 Gm., ten from 25 to 40 Gm. and five more than 40 Gm. The average total dosage was 19 Gm. The author's impression is that small doses, certainly much smaller than the 25 Gm. originally suggested, will prove sufficient in many cases. In children a daily dose of 0.2 Gm. per kilogram of body weight, reduced to 0.1 Gm. after the first twenty-four hours, is suggested. Children seem to tolerate the drug so well that in some cases much larger amounts were given. The average total dosage for children was 7 Gm. This total dosage was well tolerated by each of the nine infants. As a rule, the temperature in an interval of from twelve to thirty-six hours showed a marked drop and with it the pulse and respiratory rate. The general appearance and sense of well being of the patient showed a corresponding improvement. The temperature response seems to be a good index of the extent of improvement. Twenty-two of the twenty-seven patients in whose sputums no pneumococcus was found showed a prompt response to treatment. It is possible that further sputum examinations would have revealed pneumococci; otherwise such a high percentage of prompt responses in nonpneumococcic pneumonias would not be expected. There were no serious toxic signs in any of the cases. The mortality rate at the Nassau Hospital for all pneumonias during the last four years was 19 per cent in 1935, 20.9 in 1936, 18.1 in 1937 and 11 per cent in 1938.

Northwest Medicine, Seattle

38: 273-316 (Aug.) 1939.

Personality Traits and Mental Hygiene. A. C. Ivy, Chicago.—p. 275.
*Hodgkin's Disease with Herpes Zoster and Varicella. M. B. Marcellus, Bayocean, Ore.—p. 279.
Etiology of Herpes Zoster and Varicella. R. T. Henson, Coeur d'Alene, Idaho.—p. 283.
Gastrojejunocolic Fistula. C. R. Mowery, Spokane, Wash.—p. 283.
Spasmus Nutans. J. M. Cronin, Klamath Falls, Ore.—p. 286.
Blood Examinations in Lead Poisoning. T. E. P. Gocher, San Rafael, Calif.—p. 289.
Venereal Disease Control in Oregon. S. D. Allison, Portland, Ore. —p. 291.

Hodgkin's Disease with Herpes Zoster and Varicella.—Marcellus reports a case with the simultaneous coincidence of Hodgkin's disease, herpes zoster and varicella. The vesicular eruption of varicella had a localizing effect on the herpes zoster. Unlike some of the others formerly reported, this patient showed the clinical characteristics of varicella with symmetrical lesions which had thin and easily ruptured vesicles, containing clear fluid at first which later became pustular; the eruption spread rapidly and formed typical crusts; the mucous membranes were involved and from the history there might have been exposure to varicella, during leave from the hospital the first day of which was just fourteen days prior to the vesicular eruption, and the characteristic fever immediately preceding an almost typical eruption strongly suggested varicella or variola, but it is believed that, as he had been successfully vaccinated, the latter may be ruled out. This case undoubtedly represents the simultaneous existence of slowly progressive Hodgkin's disease, proved beyond a doubt by several biopsies at different laboratories all of which agreed, and

herpes zoster closely followed by varicella, with no recurrences of either cutaneous eruption after the patient was discharged from the hospital following the recovery from the cutaneous lesions.

Psychoanalytic Quarterly, Albany, N. Y.

8: 279-408 (July) 1939

Discovery of Edipus Complex: Episodes from Marcel Proust. G. Zilboorg, New York.—p. 279.
Problems of Psychoanalytic Technic. O. Fenichel, Los Angeles.—p. 303.
Sublimation. Frances Deri, Los Angeles.—p. 325.
Significance of Theatrical Performance. R. Sterba, Detroit.—p. 335.
Experimental Demonstrations of Psychopathology of Everyday Life. M. H. Erickson, Eloise, Mich.—p. 338.
Associative Anamnesis. F. Deutsch, Boston.—p. 354.

Public Health Reports, Washington, D. C.

54: 1467-1508 (Aug. 11) 1939

Plague in the Western Part of the United States: Infection in Rodents, Experimental Transmission by Fleas and Inoculation Tests for Infection. C. R. Eskey and V. H. Haas.—p. 1467.
Observations on Infectious Agent from Amblyomma Maculatum. R. R. Parker, G. M. Kohls, G. W. Cox and G. E. Davis.—p. 1482.

Radiology, Syracuse, N. Y.

33: 131-260 (Aug.) 1939

Roentgen Kymographic Study of Alterations in Pathologic Heart During Valsalva and Müller Tests. A. C. Morelli, Montevideo, Uruguay; translation by M. Wright.—p. 131.
Rational Radiotherapy. G. W. Grier, Pittsburgh.—p. 148.
*Cystic Disease of Lung. L. R. Sante, St. Louis.—p. 152.
Treatment of Polycythemia Vera with Roentgen Ray. I. I. Kaplan, New York.—p. 166.
Intestinal Movements in Ileocecal Region. A. E. Barclay, Oxford, England.—p. 170.
Radiology in Teaching of Anatomy. I. C. C. Tchaperoff, London, England.—p. 177.
Megaduodenum and Duodenal Obstruction: Criteria for Diagnosis. M. Sturtevant, New York.—p. 185.
*Reducing Toxic Period in Hyperthyroidism. S. C. Barrow, Shreveport, La.—p. 189.
Roentgen Ray Treatment of Skin Cancer. C. W. Perkins, Norwalk, Conn.—p. 191.
X-Ray Study of Lungs of Workmen in Asbestos Industry, Covering Period of Ten Years. A. W. George and R. D. Leonard, Boston.—p. 196.
Ulcer Niches with Stopper-Shaped Vascular Defect. Å. Åkerlund, Stockholm, Sweden.—p. 203.
Biology of Bone Metastases. J. Borak, Vienna, Austria; translation by F. J. Lust, New York.—p. 208.
Further Notes Concerning Traumatic Subdural Hematoma. S. W. Gross, New York.—p. 213.
Aneurysm of Pulmonary Artery. F. M. Groedel, New York.—p. 219.
Roentgen Diagnosis of Abdominal Effusions. R. A. Rendich, B. Ehrenpreis and T. Frattalone, Brooklyn.—p. 233.

Cystic Disease of Lung.—Sante refers to abnormal confined collections of fluid within the lung as cysts and to air-filled cavities as pneumatoceles. One of the most common types of lesion referred to as cystic disease is seen as multiple thin-walled pneumatoceles, clustering about the larger bronchial branches in the hilar regions and adjacent areas, giving rise to the condition referred to as cystic bronchiectasis. When the cavities are small and their walls are thick the term honeycomb has been applied to their appearance. Fluid cysts and pneumatoceles of the lung arise as results of definite derangement in the lung structure. These derangements can be either congenital from faulty embryologic development or acquired from infection and fibrosis. The factors which primarily influence the degree of inflation of such pneumatoceles, in which free bronchial connection is present, are the relationship of the resistance of their walls to the resistance of normal alveolar structure supplied by a bronchiole of equal size to the opening supplying the cavity. The pressure in the pneumatocele cannot exceed atmospheric pressure. On x-ray examination there should be no deviation of the mediastinum at any time. In instances in which a simple check-valve opening permits entrance of air on inspiration but checks it on expiration, the pneumatocele will enlarge in size until an equilibrium is established; the pressure within the pneumatocele cannot become greater than that of the atmosphere at maximal inspiration but may exceed this at expiration, also causing the mediastinum to be in normal position on maximal inspiration but displaced to the opposite side on expiration. Pneumatoceles which continue to expand showing higher than atmospheric pressure at all times during the respiratory cycle would seem to require the addition of some unusual pumping force to account for their expansile character. Fluid cysts may result only when the defect involves a bronchial structure which still retains secretory power. Pneumatoceles arising from the alveolar structure as a result of emphysematous involvement should not be preceded by fluid cysts, since they are not lined by secretory epithelium.

Reducing Toxic Period in Hyperthyroidism.—For some years Barrow has believed that the dosage of x-rays given in the treatment of hyperthyroidism, even by those of wide experience, is insufficient for the best interests of the patient. As the mysteries and intricacies of the ductless gland system unfold, it is well to bear in mind the possibility that there may be other functions of the thyroid than those now recognized. Surgical removal of the thyroid or proper irradiation of the gland alone will restore the patient to normal. However, no organ of the body should be removed because of dysfunction or excess function when it is possible to correct its functioning processes. The depressant action of x-rays in all conditions characterized by hyperfunction or excess cell activity is recognized. The only argument which has been advanced against roentgen therapy for hyperthyroidism is the time usually consumed in bringing the patient to a nontoxic state. Small dosage at long intervals seems to be the practice generally followed. The object of the surgeon has been to remove with one stroke the source of toxicity, the thyroid gland. Why not, then, suppress this toxicity as abruptly by radiation? Following the use of comparatively large doses of x-rays in extremely toxic cases of hyperthyroidism, the author has never seen any ill effects. On the contrary, by the application of rather intensive dosage only good results have been seen, the most toxic cases becoming nontoxic in from four to ten weeks rather than in from six to nine months (the usual time required with small doses of x-rays). If the metabolic rate is high, plus 50 or more, the application of 750 roentgens weekly, the dose divided over three areas, right and left anterior lateral and posterior, with a kilovoltage of about 130 and 3 mm. of aluminum filter, is the minimal dosage indicated. This may be repeated from six to eight times at intervals of seven days, with no ill effect on the skin. The metabolic rate should be checked each week and the doses should be spaced at longer intervals or decreased as the metabolic rate falls. The metabolic rate should be reduced to zero before treatment is discontinued; otherwise an exacerbation will inevitably follow. The fear of myxedema following irradiation is hardly to be considered when radiation is applied intelligently. Intense radiation given over the thyroid area in cases in which the thyroid is normal has not shown any bad effects on the gland. Under circumstances in which it is difficult because of distance or other causes to give weekly applications, still more intensive dosage may be applied at intervals of fourteen days (200 kilovolts, 0.75 mm. of copper filtration, with 1,200 roentgens distributed over three areas). This technic may likewise be repeated with safety but will not require as many applications, because the metabolic rate falls rapidly. In the treatment of all cases, foci of infection should be removed, iodine withheld and quinine used liberally, with, of course, restrained activity as indicated. Two charts are presented indicating the conditions existing in two typical cases of hyperthyroidism, with the treatment given and the results obtained.

Texas State Journal of Medicine, Fort Worth

35: 259-324 (Aug.) 1939

Use of Liver and Iron in Treatment of Anemia. R. L. Haden, Cleveland.—p. 266.
General Considerations of Toxemias of Pregnancy. H. J. Stander, New York.—p. 270.
Operation for Chronic Dislocation of Inferior Radio-Ulnar Articulation. J. L. Taylor, Houston.—p. 278.
Chronic Leg Ulcers: Discussion of Pathogenesis and Rationale of Treatment. R. S. Fillmore, Jacksboro.—p. 281.
Progress in Biliary Tract Surgery. C. A. Kunath, San Angelo.—p. 286.
Use of Electrocoagulation in Treatment of Tumors of Rectum. H. T. Hayes and H. B. Burr, Houston.—p. 292.
Sterility Treated by Uterotubal Insufflation with X-Ray Control. C. L. Martin, Dallas.—p. 295.
Artificial Pneumoperitoneum. B. O. Lewis, Galveston.—p. 300.
Some Aspects of Public Health Control of Syphilis. J. R. Heller Jr., New Orleans.—p. 305.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

12: 449-504 (Aug.) 1939

Report on Skiagraphic Terminology in Pulmonary Disease. The Joint Tuberculosis Council.—p. 449.
Asymmetry of Skull in Relation to Subdural Collections of Fluid. J. Hardman.—p. 455.
Short-Distance Low-Voltage X-Ray Therapy. P. A. Flood and D. W. Smithers.—p. 462.
Effect of Gamma Radiation on Cells in Vivo: Part II. A. Glücksmann and F. G. Spear.—p. 486.
Radium Implant Reconstructor. H. M. Parker and W. J. Meredith. —p. 499.

British Medical Journal, London

2: 155-208 (July 22) 1939

Pharmacologic Actions and Therapeutic Uses of Some Compounds Related to Adrenalin. J. A. Gunn.—p. 155.
*Electro-Encephalogram as Aid in Clinical Neurology. R. A. Krynauw. —p. 160.
Seasickness. R. J. Blackham.—p. 163.
Acute Phlegmonous Gastritis in Pregnancy. T. Barnett and D. P. Harris.—p. 167.
Cobalt as Factor in Control of Nutritional Anemia. H. H. Corner.—p. 169.

Electro-Encephalogram as Aid in Clinical Neurology.—From experience to date in the examination of intracranial tumors, although the electro-encephalogram is surprisingly accurate in localization in most cases, Krynauw states that the additional help given by ventriculography should not be dispensed with when operation is contemplated. Information as to the depth of a neoplasm, its absolute size and its relation to the ventricles, basal ganglions and the like can be obtained at present only by adequate air studies; and such information is essential in planning the scope of an operation or deciding on the operability of a tumor. Electro-encephalography by itself is no short cut toward the establishment of the anatomic and pathologic diagnosis of intracranial lesions. Considerable interest is attached to the study of the epilepsies by this method. Nevertheless it is in the epileptic group that the greatest difficulty occurs in the evaluation of results. In many cases of the group known as "idiopathic grand mal" there is constant electrical flux, sometimes generalized and arising from the whole cortex but often arising from one or more foci. In some cases the changes resemble closely those found in association with expanding lesions. In some cases, too, there is a tendency toward a frequent shift of the focus. These remarks apply only to those cases of epilepsy in which there is a "resting focus" of electrical flux; that is, changes which can be detected between the actual fits. These changes are constant in that individual and do not bear any time relation to the actual fits. There is, however, evidence that before a fit, perhaps for hours, a day or even longer, there is an accession in the electrical changes. On records taken at such times, bursts of waves of increased amplitude and varying rate appear not at all unlike the "larval" attacks of petit mal described by Lennox and his associates. There are many cases that clinically appear to be idiopathic grand mal in which the author has not been able to detect any abnormality of the electrical rhythm. Why this should be so is difficult to decide, but from his experience there seems to be some relation between the resting focus and cortical degeneration. In cases in which numerous minor seizures occur there is an almost constant electrical flux with occasional sudden bursts of increased activity which have been described as larval or subclinical seizures, and then again the actual petit mal attacks with even greater alterations of amplitude. The pyknolepsies are said to fall into this group. It has been claimed that in the so-called traumatic epilepsies there is never any evidence of a resting focus of electrical abnormality. The author's experience supports this, for many cases with fits after a head injury have yielded negative observations on electro-encephalography. However, he has records of several cases of gross localized cortical damage in which alterations of potential were observed, similar to those found with expanding intracranial lesions. In such cases he has assumed an underlying area of gliosis. In patients in whom the onset of fits occurs in later life after the age of 40, the possibility of an expanding lesion should be ruled out, and air studies are often called for. In the author's series the electro-encephalogram has always been normal when the encephalogram was normal, but further work is necessary before the reliability of the method can be assessed accurately.

Irish Journal of Medical Science, Dublin

No. **163:** 289-336 (July) 1939

Combating Tuberculosis in a Swedish City. A. Wallgren.—p. 289.
Method and Significance of Blood Alcohol Estimations. J. McGrath.—p. 304.
Sarcoma of Prostate in Children. I. Fraser.—p. 330.

Lancet, London

2: 171-236 (July 22) 1939

Mechanism of Diabetes Mellitus. H. P. Himsworth.—p. 171.
*Ureteric Catheterization in Pyelitis of Pregnancy. V. W. Dix and H. Evans.—p. 176.
Vertebral Fractures Complicating Convulsion Therapy. H. A. Palmer. —p. 181.
Importance of Bronchoscopy in Unresolved Pneumonia. J. E. G. McGibbon, E. T. Baker-Bates and J. H. Mather.—p. 183.
Surgical Conservation of Hearing. A. Tumarkin.—p. 189.
Angina in Pernicious Anemia with Electrocardiographic Changes and Abdominal Aneurysm. S. Vatcher.—p. 192.
Histiocytic Medullary Reticulosis. R. B. Scott and A. H. T. Robb-Smith. —p. 194.

Ureteral Catheterization in Pyelitis of Pregnancy.—During a period of four years Dix and Evans state that eighty-four cases of pyelitis of pregnancy were admitted to the London Hospital, and of these only seven required ureteral drainage: five because of failure to respond to alkali therapy and two because of excessive vomiting, making the administration of alkali impossible. Nine ureteral catheterizations were carried out. In one instance the second catheterization was necessary because the first catheter was removed by a nurse when the patient returned to the ward, and in another the second catheterization was performed three and a half months after the first during a recurrence of pyelitis. In no case was it necessary to use an anesthetic. Catheterization of the ureter during pregnancy is not easy and should be carried out only by the expert. If it should ever be necessary for the relatively inexpert to attempt catheterization in the later stages of pregnancy, an anesthetic should be given to minimize the difficulties. When the ureteral orifice has been identified and the catheterization has begun there should be no difficulty, and the fact that the catheter has reached the renal pelvis will be at once evident from the rapid flow of urine, which is considerably in excess of that from a ureteral catheter of the same size passed into a normal pelvis. In cases in which there has been a complete block at the pelviureteral junction the flow may be rapid. It is advisable to pass as large a catheter as possible. The sizes used have been 10 and 12. Great care must be taken, in withdrawing the cystoscope, to avoid displacement of the catheter. The catheter is attached to the leg and the urine is allowed to drain into a bottle. The catheter was usually left in place for three or four days. However, equally good results might be obtained if the catheter remained in place for only one or two days, although there would perhaps be a slightly increased risk of recurrence. It should be removed at once if urine ceases to run freely and gentle syringing fails to reestablish the flow. The effect of catheterization and drainage alone on the seven patients was so good that no additional treatment was needed except the continued administration of citrate. Premature induction of labor should rarely, if ever, be necessary, even in severe pyelitis of pregnancy. One case of postpregnancy pyelitis was also treated successfully by catheterization.

Medical Journal of Australia, Sydney

2: 155-192 (July 29) 1939

Health of Fetus, or True National Insurance: Review of Certain Aspects of Fetal Environment. R. Fowler.—p. 155.
Review of Experience with Cyclopropane. G. Troup.—p. 164.
Anesthesia for Specialist Nose and Throat Services. R. H. Orton.—p. 168.
Anesthesia in Acute Intestinal Obstruction. G. Brown.—p. 170.

South African Medical Journal, Cape Town

13: 507-534 (July 22) 1939

Diagnosis and Treatment of Common Anemias. J. F. Brock.—p. 509.
Bladder Neck Urinary Obstruction. S. McMahon.—p. 517.
Surgical Treatment of Cholecystitis and Gallstones. N. Garber.—p. 520.
Tuberculosis of Temporal Bone in Infants and Young Children. H. Levit.—p. 523.

Journal Belge d'Urologie, Brussels

12: 197-276 (Aug.) 1939. Partial Index

*Amicrobic Pyuria. J. A. Weytlandt.—p. 197.
Cicatrizations of Tuberculous Renal Lesions Revealed by Retrograde Ureteropyelography. M. Chevassu.—p. 202.
Case of Crossed Ectopic Kidney: Remarks on the Surgical Treatment. R. Gouverneur.—p. 211.
Two Cases of Acquired Vesical Atresia. F. H. de Beaufond.—p. 215.

Amicrobic Pyuria.—Weytlandt directs attention to cases of cystitis and pyelocystitis in which the urine is free from microorganisms. He thinks that in cases of this type it is necessary to consider first the possibility of renal tuberculosis even in the absence of acid-resistant bacilli. Another factor that must be considered is that during infections with colon bacilli there are periods in which no organisms are found in the urine even if cultures are made. The cases mentioned so far are false cases of amicrobic pyuria, but there are also cases of true amicrobic pyuria. In this connection the author mentions first cases of leukocyturia that are caused by mechanical or chemical irritation. Then there is a group of pyurias in which all cultures, including those for tubercle bacilli, remain sterile and in which even inoculations into guinea pigs produce negative results. The author says that it was Söderlund who in 1922 first called attention to this type of pyuria, which can be considered as a separate disease entity. The number of cases which have been reported since then is small, but this amicrobic pyuria is nevertheless of practical importance. Those who know it will doubtless have occasion to diagnose it. Moreover, this disorder, which formerly was extremely chronic and annoying is now curable, Wildbolz having discovered that it yields promptly to treatment with neoarsphenamine. In view of the fact that this form of amicrobic pyuria was first described by Söderlund and was first successfully treated by Wildbolz, the author suggests that it be designated Söderlund-Wildbolz disease. The etiology of the abacterial pyuria is still unknown, but in view of the curative effect of neoarsphenamine it is suggested that an infectious process is involved but that the causal agent is not necessarily a spirochete. The author describes the history of the case of amicrobic pyuria which he himself observed. The disorder began with hematuria, which was followed by cystitis. The urine contained large numbers of leukocytes but no microorganisms. Syphilis could be ruled out on the basis of the negative outcome of several serologic tests. When treatment with methenamine, phenyl salicylate and sulfanilamide had failed, the author resorted to intravenous injection of 150 mg. of neoarsphenamine. The first dose having produced considerable improvement, the patient was given two additional injections of 300 and 450 mg., respectively, at intervals of five and six days. The author thinks that two injections will suffice in most cases.

Presse Médicale, Paris

47: 1221-1228 (Aug. 9) 1939

*Condition of Adnexa in Uterine Fibromyomas and Their Surgical Consequences. A. Chalier.—p. 1221.

Adnexa in Uterine Fibromyomas.—Chalier cites prognostic and physiologic considerations which indicate that operative treatment is advisable for the majority of patients with uterine fibromatosis, but he also stresses that the idea of conservation should be foremost in the mind of the surgeon, since the majority of women who require treatment for uterine fibromatosis are of the age group between 28 and 50; that is, they are women who are in the period of genital activity, and the majority still menstruate. As regards the problem of conservation, attention must be given particularly to the uterine adnexa, and the first question which presents itself is the anatomic condition of the adnexa in patients with uterine fibromyoma—in how many cases of uterine fibromatosis the adnexa are diseased. In order to throw light on this problem, the author carefully inspected the adnexa of 212 patients who received surgical treatment for uterine fibromas. He found the adnexa diseased in 161 of the 212 cases, more than three fourths. Most frequent were the purely ovarian lesions, which were observed in 104 of the 212 patients. Purely tubal lesions were comparatively rare, existing in eleven of the women. Mixed tubo-ovarian lesions were detected in forty-five cases. The author discusses to what extent it was possible to employ conserving methods in the surgical treatment of these 212 patients. As regards the uterus, conserving operations could be employed in only twenty-four of the cases. These include six supra-isthmic hysterectomies, three hysterectomies of the fundus and fifteen myomectomies. In the other 188 cases the uterus had to be mutilated: total hysterectomy in thirty-eight and supravaginal hysterectomy in the other 150. Conservation of one or both of the adnexa was possible in ninety-eight, nearly 50 per cent of the cases. From this the author draws the conclusion that in spite of the frequency and severity of the adnexal lesions associated with uterine fibroma it is possible to preserve all or part of the ovarian apparatus in nearly 50 per cent of the cases.

Revue Neurologique, Paris

72: 1-136 (July) 1939

*Basophil Adenoma of Hypophysis. A. Austregesilo, I. Costa Rodrigues and A. R. de Mello.—p. 1.
Intradural Fibrolipoma of Medulla. J. Jabotinski.—p. 15.
Oligodendroblastoma Involving Corpus Callosum: Consideration of Syndrome of Corpus Callosum. O. Sager and I. Bazgan.—p. 32.

Basophil Adenoma of Hypophysis.—Austregesilo and his associates studied the clinical, endocrine and roentgenologic aspects of a case of Cushing's disease in which the diagnosis could be confirmed by anatomopathologic examination. They give a detailed description of the history of the patient, a woman aged 44. Since 1914, when she had entered a psychiatric hospital for the first time, she had become extremely obese and hairy. In 1937 she presented severe obesity, hirsutism, virilization and anomalies of the menstrual cycle. Her face was round and moon shaped. Her organic resistance was reduced and she was easily fatigued. Her mentality was oligophrenic. Roentgenography of the sella turcica showed normal outlines. After describing the results of the humoral examinations, the authors show that these, like the clinical syndrome, indicate basophil hypophysial hyperhormonism with involvement of the other endocrine glands. The necropsy disclosed in the lateral portion of the prehypophysis an adenomatous formation, the size of a small pea, which at some points was separated from the glandular parenchyma by a thin capsule, whereas at other points there was no separation. The cells of the adenoma showed basophil granulation. The authors point out that the patient does not present the complete symptomatology of Cushing's disease, but they also show the multiple variations to which the clinical aspects are subject as a result of the pluriendocrine-metabolic deviation, according to whether there is a stimulating or an inhibiting preponderance of certain groups of cells of hypophysial secretion. They also direct attention to the relations between the hypophysis and the diencephalon. They think that the incomplete clinical forms of Cushing's disease are the most frequent, but because of the difference in symptomatology the clinical diagnosis of these forms presents difficulties.

Schweizerische medizinische Wochenschrift, Basel

69: 757-780 (Aug. 26) 1939

The Labyrinth Does Not Represent the Organ of Equilibrium in Human Subjects. S. Erben.—p. 757.
Aspects of Bronchial Carcinoma. M. Dressler and A. Weigl.—p. 763.
New Model of Haab's Magnet. O. Haab and A. Schnetzler.—p. 767.
*Panic: Nature, Causes and Treatment. E. Bircher.—p. 768.
Alcoholism in Medical Clinic of Geneva During the Years from 1933 to 1936. M. Roch.—p. 772.

Panic: Nature, Causes and Treatment.—Bircher points out that during catastrophes treatment of the psychic injuries is as important and as much the duty of the physicians as is that of the physical injuries, and so he directs attention to the problem of panics which occur not only during wars but also in the course of earthquakes, mine accidents, fires in theaters, shipwrecks, explosions, devastations caused by meteorologic catastrophes, volcanic eruptions, famines, epidemic diseases and so on. Panic is a fear neurosis which develops in a small or large number of persons under the influence of great fear brought on by a catastrophe. This emotion may result in a sudden impairment of the consciousness and distraction, which leads to senseless excitement or, more rarely, to stuporous inhibition. The thin upper layer of consciousness is destroyed by the unexpected catastrophe and the strong instincts of the subconsciousness come suddenly to the surface and become dominant. The most important of these instincts is that of self

preservation. If this instinct becomes manifest in a mass, the phenomenon of mass fear results, which may degenerate into wild, uncontrolled flight. At the onset not all the members of the group are necessarily in the grip of this fear. It is enough that some, usually those having a psychopathic constitution, the unstable, succumb to the threat and in a mysterious, epidemic suggestion, everybody, even the strongest, is carried along. The author further discusses various types of panic, military, economic and so on, and points out that panics are observed also among animals. He thinks that the attitude toward life plays a part in the development of panics; that Asiatics and Mohammedans, whose attitude is more fatalistic, are less likely to be influenced by catastrophes than are Europeans, for instance. Some peoples seem to be more predisposed to panics than are others, but none are entirely immune to them. The degree of reactivity may differ, but culture or civilization does not have much effect in this respect, for panic is an atavism toward the primitive, perhaps even to the animal. The greater the discipline among a people, the lesser is the danger of panic. Declining and weakened peoples are more subject to panic than are others. In the therapy of panics, personalities with self possession, resolute determination and clear vision are most important, for they alone will know how to overcome the panic by the power of suggestion. Psychologic education of the masses and strengthening of the authority are important in counteracting the tendency toward panics. Discipline which comes from within and which is based on conviction or a great idea is stronger than that which is imposed from the outside.

Zeitschrift für klinische Medizin, Berlin

136: 439-576 (July 27) 1939. Partial Index

Indication for Blood Transfusion in Internal Medicine and Its Therapeutic Effect. H. Toussaint.—p. 439.
Effects of Tobacco on Teeth. L. H. Strauss and J. Föckeler.—p. 468.
*Hereditary Biology of Pernicious Anemia. O. Kaufmann and K. Thiessen.—p. 474.
Dependence of Surface Tension on Hydrogen Ion Concentration. C. J. Keller and O. Künzel.—p. 507.
Structural Changes in Granulocytes After Administration of Aminopyrine. H. Bernigau.—p. 517.
Changes of Red Blood Picture After Gastric Resection. Magdalene Dreher.—p. 525.
Significance of Typical and Atypical Bundle-Branch Block for Estimation of Working Capacity. L. H. Strauss and F. Bolt.—p. 560.

Heredity in Pernicious Anemia.—Citing reports from the literature, Kaufmann and Thiessen show that it cannot be doubted that hereditary factors play a part in the pathogenesis of pernicious anemia. In order to obtain more information about this problem, they made studies on the relatives of patients with pernicious anemia. Their material comprises forty-eight family groups, in which 168 persons were examined. Specimens of gastric juice of an additional twenty-three relatives were examined, and anamnestic data of a number of other relatives were obtained by means of questionnaires. Summarizing the results obtained in these studies, the authors say that they detected the multiple occurrence of pernicious anemia in eight of the forty-eight families, that is in 16.7 per cent. Once it occurred in uniovular twins, once in three sisters, twice in mother and son, twice in brothers, once in brother and sister and once in cousins. That they detected multiple familial occurrence of pernicious anemia more frequently than did other investigators is ascribed by the authors to the fact that most of their patients with pernicious anemia were of an advanced age so that an existing predisposition in siblings and other relatives had time to become manifest. The multiple familial occurrence of pernicious anemia is so considerable that accident cannot explain it and heredity must be assumed. The authors also observed the concurrence in the same families of pernicious anemia and essential hypochromic anemia. They say that the familial concurrence of these two forms of anemia has been reported so frequently that a common hereditary factor must be assumed. A pathogenic connection of the two disorders is indicated also by the repeated observation of a transition of essential hypochromic anemia into pernicious anemia. The multiple appearance in their material of anacidity, of subacidity, of hematic symptoms resembling those of pernicious anemia, of soreness of the tongue and of atrophy of the lingual mucosa is regarded by the authors as further evidence of the transmission of hereditary factors of pernicious anemia. They gained the impression that the increased incidence of anacidity or subacidity in the families of patients with pernicious anemia is of especial significance because its hereditary transmission apparently is dominant. Their statement that the results of their investigation indicate hereditary origin in about half of their cases does not signify that in the other cases signs of hereditary transmission were entirely absent; cases in which there were an increased color index and hypersegmentation but normal gastric secretion were not grouped with those in which hereditary origin was certain. They consider it possible that heredity plays a part in all cases of pernicious anemia. On the other hand, they think that there may be purely exogenic, nonhereditary cases of pernicious anemia.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 3573-3684 (July 15) 1939. Partial Index

Nerve Injuries in Fractures of Lower End of Humerus. L. D. Eerland.—p. 3574.
Determination of Hormones in Urine of Patients with Tumors of Testes, Especially with Chorionepithelioma. E. Dingemanse and E. Laqueur.—p. 3582.
Leptospirosis in Atjeh. G. F. Kotter.—p. 3590.
*Action of Subcutaneously Administered Carbon Dioxide Gas in Angiospastic Disorders. J. C. Mom.—p. 3595.
Suppurating Pulmonary Cyst Treated by Lobectomy: Case. H. W. Hoefnagels.—p. 3598.

Subcutaneous Carbon Dioxide in Angiospastic Disorders.—Mom points out that carbon dioxide stimulates the respiration as proved by the administration of oxygen-carbon dioxide mixture in cases of asphyxia. He discusses particularly the stimulating effect of the subcutaneously administered gas on the terminations of the vagosympathetic nervous system in the skin. Having observed that Romeuf employed this treatment with success in vasomotor disturbances, such as intermittent claudication, acrodynia, acrocyanosis and Bürger's disease, the author also decided to try it. He injects each time from 40 to 50 cc. of the gas under the skin of the arm or leg. If necessary, from 300 to 400 cc. can be injected in one session at different sites. The use of a manometer is desirable so that the pressure of 2 meters of water (about 150 mm. of mercury) is not exceeded. A patient who is resting requires from four to sixteen hours for resorption, an ambulatory patient several hours. The vasodilator effect of this treatment produces a better blood perfusion of the treated area.

83: 3769-3872 (July 29) 1939. Partial Index

Psittacosis in Amsterdam Detected with Aid of Complement Fixation Reaction. A. Charlotte Ruys, A. L. Noordam and H. Vervoort.—p. 3776.
*Effective Insulin Suppository. B. Brahn and T. Langner.—p. 3784.
Ambulatory Feeding with Jejunal Tube in Patients with Gastric and Duodenal Ulcers. R. A. Hoekstra.—p. 3791.
Treatment of Adiposity. J. Groen.—p. 3799.

Effective Insulin Suppository.—Brahn and Langner say that rectal administration of insulin has not been possible heretofore because insulin is destroyed by tryptic ferments. The authors decided to find a way to protect the rectally administered insulin against destruction (1) by adding acid in order to protect it against tryptic digestion and (2) by adding substances that increase surface tension so as to increase the rapidity of absorption. In numerous experiments on animals and human subjects the authors demonstrated that suppositories consisting only of insulin and cocoa butter (theobroma oil) are ineffective in animals as well as in human subjects. However, by adding acid it was possible to make the insulin effective and protect it against tryptic influences. The authors experimented with hydrochloric acid and with several organic acids such as lactic acid, acetic acid, citric acid, tartaric acid and palmitic acid. They found most effective a mixture of lactic and palmitic acids. Because the latter acid has a melting point of 60 C., it must be mixed with cocoa butter in a ratio of 15:85, thus bringing the melting point to about 33 C. Further experiments proved that the addition of saponin increases the efficacy of insulin suppositories. Experimenting with various types of saponin, the authors found that saponaria saponin, although harmless in oral administration, is dangerous in rectal administration. Other saponins were found to be harmless, however. Following rectal application of the insulin suppositories prepared by the authors,

the effect on the blood sugar is rapid, the maximum being reached in from thirty to forty minutes. After that the action decreases rapidly. Increasing the insulin dosage not only intensifies the action but also prolongs its duration.

Acta Medica Scandinavica, Stockholm

100: 485-606 (July 1) 1939

*Role of Hypophysis in Pathogenesis of Total Alopecia. E. Kylin and E. Dicker.—p. 485.
Reticular Cells in Human Bone Marrow and Genesis of Monocytes. N. G. Nordenson.—p. 507.
Effect of Ingestion of Food on Plasma Proteins. J. B. Rennie.—p. 545.
Determination of Urine Fluorescence and Its Diagnostic Value, Especially in Carcinomas. F. I. Simon.—p. 553.
Carbohydrates in Diabetes Therapy With or Without Insulin. M. Lauritzen.—p. 559.
Angina Pectoris and Pressoreceptor Regulation. S. Wassermann and H. Weber.—p. 589.

Hypophysial Deficiency in Alopecia.—Kylin and Dicker report the clinical analysis of alopecia in twenty-nine persons (thirteen male and sixteen female) ranging in age between 5 and 61 years. A hereditary tendency was established for nine of the fifteen patients questioned with regard to familial occurrence. Two cases are given in detail and their mendelian significance pointed out. The disease, characterized by partial or total loss of hair at all areas of the body, did not affect the general health, left basal metabolism and blood pressure nearly always normal, occurred in six cases synchronously with the first menstruation, was accompanied by dental caries in fourteen, by brittleness of the nails and cutaneous modifications in fifteen, by constipation in half of the cases and by the appearance of anxiety, frequent headaches and constant chilliness and asthenia in 50 per cent at its first manifestation. With endocrine abnormality clearly in evidence, the authors were led to eliminate the direct pathogenesis of the sexual, adrenal, thyroid and parathyroid glands and to concentrate on the hypophysis as the causative factor. In this they were supported by the clinical evidence of a previous case incorporated in the paper. Therapy of the cases studied was twofold: (1) oral doses of hypophysial (anterior lobe) extract, which resulted in three complete cures, two partial cures and one negative issue; (2) grafting of two whole calf hypophyses, yielding two complete, four partial and two negative issues. (The previous patient was therapeutically managed both ways and cured after intervention of pregnancy and recidivation of alopecia.) The authors buttress the paucity of their cases and cures by reference to those of other therapists. They regard the amelioration or success obtained with other endocrine medicaments as confirmatory of their own, in view of the dominance of the hypophysis in the endocrine system. Among the conclusions of the authors the following may be mentioned: 1. Complete alopecia affects both sexes at all age levels, with the greatest incidence at the age of 23 to 25 years. 2. Total alopecia is heritable and obeys the mendelian laws. 3. The hypophysis plays an important part, though it cannot at present be determined whether the whole gland is involved or only one of its parts and whether the gland affects pilosis directly or through other endocrine glands. 4. Grafting with whole calf hypophyses gives just as good results as oral or parenteral administration of hypophysial extract.

Nordisk Medicin, Helsingfors

3: 2051-2132 (July 8) 1939. Partial Index

Hospitalstidende

*After-Examination of Patients with Uncomplicated Concussion of Brain, with Special Regard to Importance of Duration of Primary Rest in Bed. S. With.—p. 2057.
Icelandic Mud for Mud Packs. K. Hannesson.—p. 2072.

After-Examination in Concussion of Brain.—With asserts that brief individualized confinement to bed in uncomplicated concussion of the brain does not seem to give less favorable results either as to the time when the patients are able to resume their full work or as to the number of patients whose injuries are permanent than in corresponding groups treated with prolonged rest in bed, nor is the tendency to graver permanent injuries greater. He reviews the 394 cases (272 of mild, ninety-seven of moderate, twenty-five of grave concussion) treated in Sundby Hospital from 1924 to 1934 with individualized confinement to bed according to the duration of the symptoms. In 257 cases (65 per cent) the rest in bed was for less than one week, in ninety-five (24 per cent) from one to two weeks, in thirty-one (8 per cent) from two to three weeks, in eight (2 per cent) from three to four weeks, in three (1 per cent) four weeks or more. He examined 328 patients (84 per cent) in their homes; 9.6 per cent could not be traced and 6.4 per cent had died, presumably not from accident. Permanent sequelae were found in 16.1 per cent (severe sequelae in six cases, moderate in eight, slight in seven, very slight in twenty-seven). The tendency to permanent injury, he says, increases with age. There was no demonstrable connection between the severity of the acute symptoms and the occurrence of permanent sequelae. Work was resumed within one month after discharge by 66 per cent of the patients and within from one to three months by 18 per cent. Less than 1 per cent were permanently disabled. Of 250 without permanent injury, 57 per cent were wholly free from symptoms one month after discharge, 73 per cent in all three months after discharge. In the remaining 27 per cent the general postcommotional symptoms disappeared more slowly.

Finska Läkaresällskapets Handlingar

Significance of Focal Infection in Rheumatic Fever. M. Savolin.—p. 2077.
Experiences with Three Carcinoma Reactions. L. Furuhjelm.—p. 2082.
*Sedimentation Reaction in Ischialgias. H. Hortling.—p. 2086.

Sedimentation Reaction in Ischialgia.—Hortling made sedimentation tests three or four times, at intervals of one week, in 198 cases of grave ischialgia. An increased sedimentation reaction was established in fifty-two cases (26.3 per cent). In eighteen the increase was transient; in eleven of these the ischialgic symptoms had originated in connection with an infectious disorder; seven were considered cases of "genuine" ischialgia. In thirty-four cases there was a constantly increased sedimentation reaction, in sixteen explainable by simultaneous general disorder, in eighteen without demonstrable cause. In the cases connected with infections, unlike those in the other groups, there was no history of earlier ischialgic symptoms. Neuritic symptoms were present equally often in the cases with normal and those with increased sedimentation, and the sedimentation was not increased more often in the bilateral than in the unilateral cases. No connection was demonstrable between rise in temperature and increased sedimentation. Since from his results the author assumes that one fourth of the cases of ischialgia are, at least in part, combined with disorder of local or general nature which causes increased sedimentation, he considers the sedimentation reaction important because of the therapeutic possibilities.

Norsk Magasin for Lægevidenskapen

Seven Cases of Weil's Disease. O. Svaar-Seljesæter.—p. 2089.
Course of Pulmonary Tuberculosis in Children: After-Examination of Patients Discharged from Reknes Children's Sanatorium from 1918 to 1932. T. J. Olsen.—p. 2095.
*Vertebral Fracture in Metrazol Shock Treatment. H. H. Dedichen.—p. 2101.
What Was Cause of Death? Epidural Hematoma or Hemorrhages in Brain Stem? O. Berner.—p. 2104.

Vertebral Fracture in Metrazol Shock.—Dedichen says that while fractures, usually of the neck of the femur, but also of the scapula and the pelvis, have been described in connection with metrazol shock, he has found but one instance reported of compression fracture in the vertebral column due to this treatment. In a short time he has observed such fractures, some grave, in six of eighty cases treated in his hospital, and similar fractures have been noted in other hospitals since attention has been called to them. These fractures do not occur in epileptic patients because the tonic stage is not so long and violent as in the metrazol attacks; the injury occurs during the tonic stage. The fractures resemble those seen in tetanus. The anterior part of the vertebra is almost always compressed, without injury to the spinal cord, and the posterior part remains intact. There is a slight gibbus. The fracture usually occurs between the third and the ninth thoracic vertebra, where kyphosis is most marked. The author now avoids these fractures by placing a firmly folded blanket under the region of the scapula, removing the pillow and having the patient stretched full length during the metrazol seizures, not allowing him to double himself up during the attacks. The most exposed anterior parts of the vertebra are thus kept apart and the stronger posterior parts receive most of the pressure.